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ALL MAPS IN FIGURE A, APPENDIX D - BOREHOLE LOGS

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FIGURE A-2 & A-3 (PARTIALLY SCANNED)

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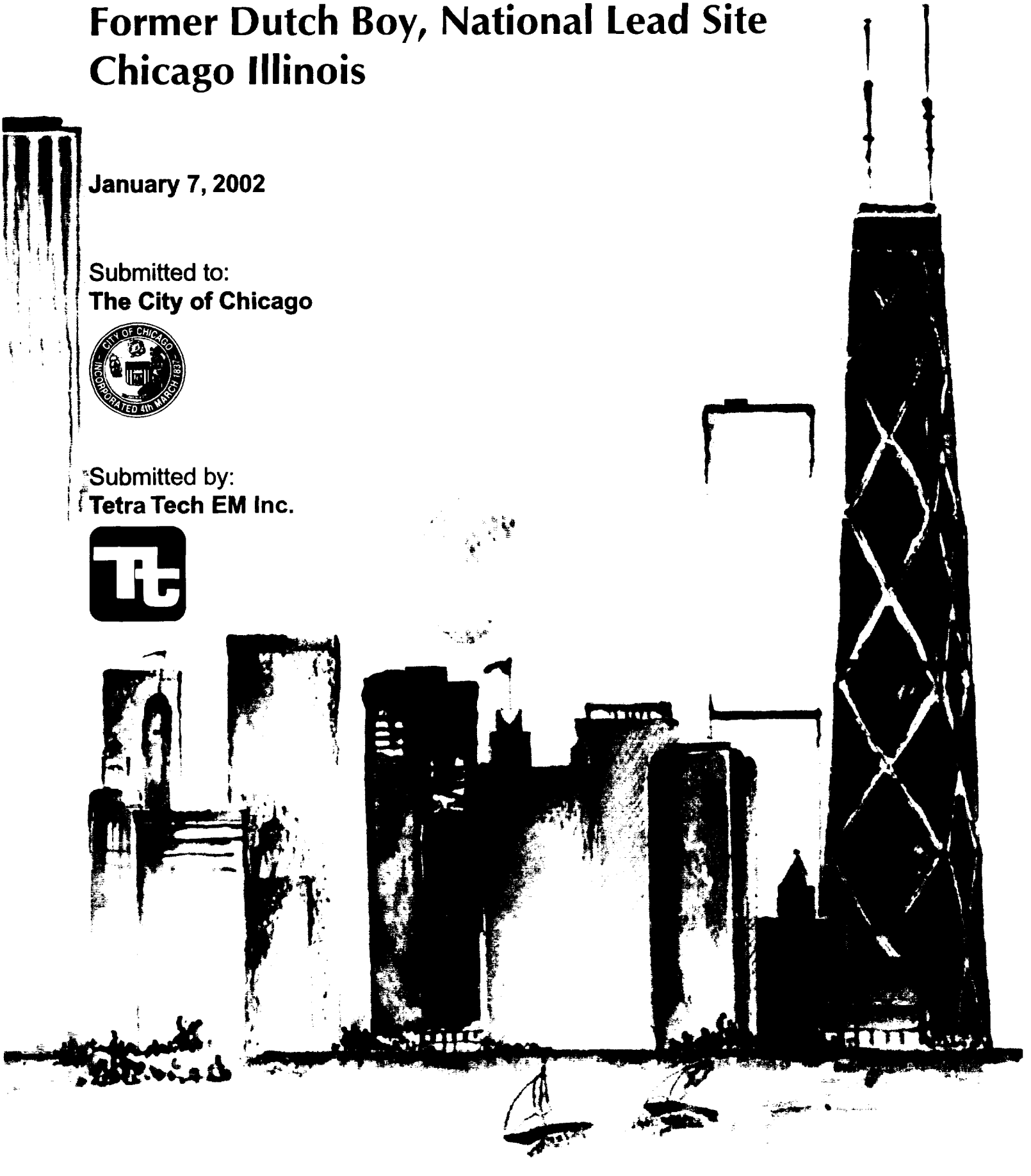
Rev. 07/10/02

COMPREHENSIVE SITE INVESTIGATION
West Pullman Industrial Redevelopment Area
Study Area No. 13
Former Dutch Boy, National Lead Site
Chicago Illinois

January 7, 2002

Submitted to:
The City of Chicago

Submitted by:
Tetra Tech EM Inc.



170206

COMPREHENSIVE SITE INVESTIGATION
WEST PULLMAN INDUSTRIAL
REDEVELOPMENT AREA, STUDY AREA NO. 13
FORMER DUTCH BOY, NATIONAL LEAD SITE
CHICAGO, ILLINOIS

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January 7, 2002

CONTENTS

Appendix

Attachment

ABBREVIATIONS AND ACRONYMS

$\mu g/m^3$	Microgram per cubic meter
accd	Above Chicago city datum
ACM	Asbestos-containing material
AST	Aboveground storage tank
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CDOE	City of Chicago Department of Environment
CID	Waste Management CID RDF
CLP	Contract Laboratory Program
cm/s	Centimeter per second
CSI	Comprehensive site investigation
DRO	Diesel range organics
E&E	Ecology & Environment, Inc.
Earth Tech	Earth Tech, Inc.
Environ	ENVIRON Corporation
EOC	Extent of contamination
EP	Extraction procedure
ESA	Environmental site assessment
ESC	Environmental Strategies Corporation
GRACE	Grace Analytical Laboratories
GRO	Gasoline range organics
Harza	Harza Consulting Engineers and Scientists
IAC	*Illinois Administrative Code*
IDPH	Illinois Department of Public Health
IEPA	Illinois Environmental Protection Agency
Ingersoll	Ingersoll Steel Disk Division
International Harvester	International Harvester Company
LCS	Laboratory control sample
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
MS	Matrix spike
MSD	Matrix spike duplicate
NAAQS	National Ambient Air Quality Standard
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
QA/QC	Quality assurance and quality control
RCRA	Resource Conservation and Recovery Act
RPD	Relative percent difference
SAIC	Science Applications International Corporation

ABBREVIATIONS AND ACRONYMS(continued)

Sanborn	Sanborn Fire Insurance
SDG	Sample delivery group
Simon	Simon Hydro-Search, Inc.
SOP	Standard operating procedure
SRP	Site Remediation Program
STL	Severn Trent Laboratories
SVOC	Semivolatile organic compound
SW-846	"Test Methods for Evaluating Solid Waste"
TACO	Tiered Approach to Corrective Action Objectives
TCLP	Toxicity characteristic leaching procedure
Tetra Tech	Tetra Tech EM Inc.
Toxcon	Toxcon Engineering Company, Inc.
TPP	Total Priority Pollutant
UAO	Unilateral administrative order
U.S. EPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	Underground storage tank
VOC	Volatile organic compound
WCC	Woodward-Clyde Consultants
yd^3	Cubic yard

1.0 EXECUTIVE SUMMARY

Tetra Tech EM Inc. (Tetra Tech) conducted a comprehensive site investigation (CSI) at West Pullman Industrial Redevelopment Area Study Area No. 13, also known as the former Dutch Boy, National Lead site. The CSI was completed in accordance with Title 35 of *Illinois Administrative Code* (IAC) Part 740 under the Illinois Environmental Protection Agency (IEPA) Site Remediation Program (SRP). The objectives of the CSI were to (1) define the limits of impacts on subsurface soils, (2) assess the quality of groundwater in the perched aquifer beneath the site based on groundwater remediation objectives, and (3) assess the quality of site soil in terms of industrial-commercial and construction worker scenarios and groundwater migration routes.

The site history was developed based partly on Sanborn Fire Insurance (Sanborn) Maps issued from 1911 to 1993. The site was owned by the Carter White Lead Company and later by National Lead. Former site operations included manufacturing of lead oxide. Buildings at the site included two oil houses, an oil refinery, a corroding house, a wash house, an engine room, a mill house, a blow house, a machine shop, and a warehouse. Railroad spurs crossed the site. Seven linseed oil tanks and several aboveground storage tanks (AST) were formerly present on the site property. Historical operations at the site resulted in significant lead contamination.

Since 1986, the site has been subjected to several site assessments and remedial actions. IEPA removed process and production equipment and demolished site buildings in 1986 and removed 130 cubic yards (yd^3) of lead-contaminated soil in 1987. Site assessments conducted on behalf of IEPA, the U.S. Environmental Protection Agency (U.S. EPA), and the City of Chicago Department of Environment (CDOE) revealed total lead concentrations of up to 50,000 milligrams per kilogram (mg/kg) and toxicity characteristic leaching procedure (TCLP) lead concentrations of up to 694 milligrams per liter (mg/L) in site soil. U.S. EPA prepared an interim final risk assessment for the site and calculated a risk-based total lead cleanup goal of 1,400 mg/kg.

In 1999, National Lead implemented remedial actions in accordance with a unilateral administrative order (UAO) issued by U.S. EPA. All soil in on-site unpaved and paved areas and in off-site parkway areas containing lead concentrations exceeding 1,400 mg/kg was excavated, treated, and disposed of. In addition, all site underground storage tanks (UST) and ASTs were removed. In 2000 and 2001, CDOE implemented additional removal actions at the site, including (1) surface debris removal, (2) asbestos and

water removal in building basements, (3) concrete removal, and (4) excavation and disposal of lead-contaminated soil.

The site is underlain by fill material, sand, silty clay, and clay. Discontinuous perched groundwater is present in the sand and the silty clay 6 to 8 feet below ground surface (bgs). The perched groundwater is present within 10 feet bgs, and no sand or gravel layer is 5 or more feet thick. In addition, the site geology is primarily made up of silt and clay having a hydraulic conductivity of less than 1×10^{-4} centimeters per second (cm/s). The site is not located within the minimum setback zone of a well that is used to obtain potable water. Based on these findings, groundwater in Study Area No. 13 meets the requirements of 35 IAC Section 620.220; therefore, the groundwater is classified as Class II general resource groundwater. For this reason and because the City of Chicago has a municipal groundwater use restriction ordinance, the groundwater ingestion pathway can be excluded from consideration providing that all provisions of 35 IAC Sections 742.320 and 742.1015 are met.

Tetra Tech conducted CSI field activities in May 2001. The activities included drilling soil borings, installing temporary groundwater sampling points, and sampling soil and groundwater. Soil samples were sent to a laboratory for analysis for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), polychlorinated biphenyls (PCB), herbicides, Total Priority Pollutant (TPP) metals, TCLP lead, gasoline range organics (GRO), diesel range organics (DRO) and pH. Groundwater samples collected from the temporary monitoring wells were sent to a laboratory for analysis for VOCs, SVOCs, and TPP metals. Tetra Tech evaluated and validated all sample analytical results in accordance with IEPA and U.S. EPA guidance documents. Based on the validation, all sample analytical results are acceptable; however, in some cases, the results are appropriately qualified and should be viewed as estimated.

The laboratory analytical results for the soil and groundwater samples indicate that constituents of concern are present on site at concentrations exceeding Tiered Approach to Corrective Action Objectives (TACO) Tier 1 remediation objectives. Because the future use of the site is not known, analytical results for soil samples collected above the groundwater table were compared to the TACO Tier 1 ingestion and inhalation exposure route soil remediation objectives for both the industrial-commercial and construction worker scenarios.

Section 2.0 of this report summarizes site characterization information obtained during previous investigation activities performed in Study Area No. 13. Section 3.0 summarizes the site-specific

sampling plan. Section 4.0 presents documentation of field activities, including sample analytical results. Section 5.0 presents the endangerment assessment. Section 6.0 presents Tetra Tech's conclusions and recommendations based on CSI activities. References used to prepare this report are listed after Section 6.0. The figures cited in this report are presented in Appendix A, the tables cited are presented in Appendix B, data validation results are presented in Appendix C, and site borehole logs are presented in Appendix D. The site legal description is included in Attachment A, and the laboratory data packages are included in Attachment B.

2.0 SITE CHARACTERIZATION

This section (1) discusses previous investigations at the site, (2) summarizes the remedial actions conducted at the site, (3) summarizes the site history, (4) presents a site description, and (5) discusses site maps presented in Appendix A of this report.

2.1 PREVIOUS INVESTIGATIONS

This section summarizes previous site investigations conducted by the following parties: IEPA; Toxcon Engineering Company, Inc. (Toxcon); Ecology & Environment, Inc. (E&E); Simon Hydro-Search, Inc. (Simon); Harza Consulting Engineers and Scientists (Harza); U.S. EPA; Science Applications International Corporation (SAIC); ENVIRON Corporation (Environ); and Tetra Tech.

2.1.1 IEPA Removal Action

An IEPA removal action was conducted at the site in three phases in June and November 1986 and 1987.

During a Phase I assessment in June 1986, IEPA removed and disposed of surficial solids suspected or known to contain lead and asbestos.

During a Phase II assessment in November 1986, IEPA sampled, analyzed, and disposed of the liquids, solids, and sludges in all the site ASTs and USTs. IEPA also removed all existing process and production equipment, baghouses, mixing tanks, screw conveyors, hoppers, masonry rubble, asbestos, and debris. Additionally, IEPA demolished all free-standing building walls.

During a Phase III assessment in 1987, IEPA assessed the structural integrity of the site USTs and concluded that they were structurally sound and did not leak. Soil samples were collected and analyzed for lead. Analytical results indicated that 130 yd^3 of soil on and adjacent to the site contained extraction procedure (EP) toxicity extract lead concentrations greater than 5 mg/L and that 140 yd^3 of soil contained more than one percent lead.

2.1.2 Toxcon Field Investigation

In June 1987, Toxcon collected 34 samples from locations on site and in the parkway across the street from the site on behalf of National Lead. Samples collected from the northeast and west portions of the site contained total lead concentrations of 11,400 and 50,000 mg/kg, respectively. The sample from the west portion of the site had an EP toxicity extract lead concentration of 41 mg/L. Additional field sampling was conducted in June 1988, and Toxcon concluded that one on-site area and two off-site areas contained EP toxicity extract lead concentrations greater than 5 mg/L (ESC, 1999e).

2.1.3 E&E Site Reconnaissance

In 1991, E&E conducted an investigation of the site on behalf of U.S. EPA. E&E observed small piles of household and construction refuse scattered over the site. Because potentially hazardous substances and lead-containing soil were still present, E&E concluded that potential release of hazardous substances to air posed a threat to human health. E&E recommended that the site be secured to prevent public access and that the site be further investigated to determine whether it posed a potential threat to the community. On August 10, 1993, U.S. EPA, IEPA, and E&E conducted a site assessment. No soil piles or exposed soils were identified, and no soil samples were collected (ESC, 1999e).

2.1.4 Simon Environmental Assessment

On August 25 and 26, 1993, Simon collected 11 soil samples from seven on-site locations on behalf of National Lead. Samples collected along the loading dock and railroad spur on the west side of the site contained total lead concentrations as high as 45,700 mg/kg and TCLP lead extract concentrations as high as 694 mg/L. Samples collected in the road outside the northeast corner of the site contained total lead concentrations as high as 19,200 mg/kg and a maximum TCLP lead extract concentration of 98.4 mg/L (ESC, 1999e).

2.1.5 Harza Site Investigation

On May 10, 1994, Harza conducted a site investigation on behalf of the City of Chicago. Harza collected 13 wipe samples and 13 scrape samples from the former mill building on site. Of these samples, 7 wipe and 8 scrape samples met the Illinois Department of Public Health (IDPH) definition of a lead-bearing substance. Six soil samples were collected from depths of 6 and 15 feet bgs and were analyzed for TCLP

lead. One additional soil sample was collected from a depth of 1 to 2.5 feet bgs for TCLP lead analysis. All the samples had TCLP lead extract concentrations at or below the 5.0-mg/L Resource Conservation and Recovery Act (RCRA) concentration that defines a hazardous waste (ESC, 1999e).

2.1.6 U.S. EPA Site Assessment

On June 8, 1995, U.S. EPA, E&E, and Harza conducted an additional site assessment. Six soil samples were collected and analyzed for lead. Total lead was detected in on-site soil at concentrations ranging from 1,540 to 31,700 mg/kg. A sample collected along the northernmost loading dock had a TCLP lead extract concentration of 351 mg/L (ESC, 1999e).

2.1.7 SAIC Site History Review

In February 1996, U.S. EPA's contractor, SAIC, reviewed available reports regarding the site and assessed the potential for a release of lead from the site. SAIC calculated that approximately 166 tons of lead had been released to air between 1906 and 1980 from site manufacturing processes. SAIC assumed that each of the manufacturing processes had a short stack, a low emission exit velocity, and a low temperature and predicted that most of the lead emissions were within several hundred feet of the site.

2.1.8 U.S. EPA Interim Final Risk Assessment

In March 1996, U.S. EPA prepared an interim final risk assessment for the site. U.S. EPA assumed that the site would be used for occupational purposes and that it would not be frequented by small children. Based on these assumptions, U.S. EPA calculated a risk-based cleanup goal of 1,400 mg/kg as the average total lead concentration for site soils. U.S. EPA concluded that any site locations with total lead concentrations higher than 1,400 mg/kg should be remediated (ESC, 1999e).

2.1.9 Environ Extent of Contamination Survey

In 1997, an extent of contamination (EOC) survey was conducted at the site by Environ. The objective of the survey was to evaluate the vertical and horizontal extent of lead contamination in soil at the site and in its vicinity. Over 350 soil samples were collected from 151 locations and analyzed for lead. The on-site soil containing lead concentrations greater than the 1,400-mg/kg risk-based cleanup goal was found to be generally limited to the unpaved west portions of the site, including the area of the railroad

spurs leading to the loading dock. Lead concentrations in surface soil in the railroad spur area ranged from 5,000 to 10,000 mg/kg. In addition, selected soil samples were analyzed for other chemicals to evaluate their potential impact on remedial technologies. Diesel-related petroleum hydrocarbons were identified in soil samples collected near the loading dock in the northwest corner of the site. The petroleum hydrocarbon-impacted soil was found to be confined to the immediate vicinity of the USTs near the loading dock.

2.1.10 Environ Risk Management Plan Preparation

In 1998, National Lead retained Environ to prepare a risk management plan for mitigation of risks to human health and the environment posed by the site. The four remedial alternatives developed to mitigate risks posed by the lead contamination included (1) on-site containment, (2) excavation of "principal threat waste" (defined by U.S. EPA as having a lead concentration of 40,000 mg/kg), (3) excavation of 2 to 4 feet of contaminated soil, and (4) excavation of all contaminated soil. The remedial action recommended by Environ was to excavate the top 2 to 4 feet of soil in the "principal threat" area, treat and dispose of the soil off site, and backfill and place 5 feet of soil cover over unpaved areas.

2.1.11 Tetra Tech Preliminary Site Investigation

Tetra Tech completed a preliminary site investigation on July 13, 1999. This investigation was completed to determine whether additional soil should be remediated by National Lead during the ongoing remedial action. The preliminary site investigation included advancement of five continuous soil borings (SB-1 through SB-5) in the area remediated by Environmental Strategies Corporation (ESC). Soil samples collected during the investigation were analyzed for VOCs, SVOCs, TPP metals, and pH. The results of this preliminary site investigation are presented along with the CSI results in Section 5.0.

2.2 REMEDIAL ACTIONS

This section discusses remedial actions implemented at the site by National Lead and CDOE.

2.2.1 National Lead Implemented Remedial Actions

In accordance with a March 26, 1996, UAO issued by U.S. EPA, National Lead implemented a remedial action to abate risks associated with lead-contaminated soil at the site. ESC performed the remedial action, which included excavation, treatment, and disposal of all soil in unpaved areas of the site and soil in off-site parkways containing total lead concentrations greater than U.S. EPA's risk-based cleanup goal of 1,400 mg/kg. The action also included removal of all site USTs and ASTs. The remedial action was performed between May 6 and October 21, 1999. The remedial action was intended to eliminate the potential for exposure of the public to lead-containing soil. In addition, an engineered cap is to be placed over the remediated area. The work performed on site in unpaved areas, on site in paved areas, and off site in parkway areas is described below.

2.2.1.1 On-Site Unpaved Areas

A total of 7,848 tons of lead contaminated soil was excavated from the on-site unpaved areas and stockpiled. About 7,236 tons of this soil was treated by stabilization and transported for disposal at Waste Management CID RDF (CID) Landfill in Calumet City, Illinois. Samples of the treated soil were collected and analyzed for TCLP lead. TCLP lead extract concentrations in the 14 treated soil samples did not exceed the RCRA regulatory level of 5.0 mg/L; therefore, the treated soil was acceptable for disposal as nonhazardous waste. In addition, 612 tons of soil were left untreated and disposed of at CID Landfill. Samples of the untreated soil did not contain TCLP lead extract concentrations above 5.0 mg/L; therefore, the 612 tons of untreated soil was disposed of as nonhazardous waste.

A total of 51 final confirmation soil samples were collected from the unpaved areas and analyzed for total lead. Total lead concentrations in the final confirmation soil samples did not exceed the U.S. EPA risk-based cleanup goal of 1,400 mg/kg. Excavation depths ranged from 2 to 4 feet bgs in the unpaved areas.

ESC removed a 2-yd^3 sediment pile from beneath the east side of the former mill building. A total of 113,500 gallons of storm water was collected during the remedial action and disposed of at the CID Biological Treatment Center in Calumet City, Illinois.

Nine USTs were removed and disposed of off site. Soil was excavated in the UST area to a depth of at least 9 feet bgs. A total of 234 yd^3 of concrete was removed from the UST area and disposed of. A total

of 17 confirmation soil samples were collected from the UST excavation and analyzed for total lead. The confirmation soil samples contained total lead concentrations below the U.S. EPA risk-based cleanup goal of 1,400 mg/kg except for one sample (UST-017), which contained a total lead concentration of 1,700 mg/kg and was collected from a depth of 9 feet bgs.

Eight confirmatory soil samples were collected from the excavations for two 10,000-gallon fuel oil and mineral spirits USTs and were analyzed for VOCs and SVOCs. No sample concentrations of VOCs or SVOCs exceeded TACO Tier 1 soil remediation objectives for the ingestion exposure pathway for industrial-commercial properties. Eight confirmatory soil samples were collected from the excavations for two 10,000-gallon linseed oil USTs and three 30,000-gallon linseed oil and mineral spirits USTs and were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and polynuclear aromatic hydrocarbons (PAH); in addition, one confirmatory soil sample was collected from the piping area near the loading dock and analyzed for BTEX and PAHs. No sample concentrations of VOCs or SVOCs exceeded the TACO Tier 1 soil remediation objectives for the ingestion exposure pathway for industrial-commercial properties. Excavation depths in the UST area ranged from 9 to 11.5 feet bgs. Samples of the flowable fill used as backfill from the bottom of the UST excavations to about 4 feet bgs were collected and analyzed for VOCs, PAHs, total lead, and TCLP lead. Total lead concentrations in the samples ranged from 340 to 486 mg/kg, and TCLP lead extract concentrations were below the detection limit.

A total of 8,180 yd^3 of backfill was placed and compacted at the site. About 0.6 acre of the site was seeded and mulched. A total of 40 yd^3 of debris that potentially contained lead-impacted soil was treated, and 350 yd^3 of debris was removed and disposed of off site. Of the total 350 yd^3 of debris, 275 yd^3 was asbestos-containing material (ACM); 45 yd^3 was asphalt, brick, and concrete; and 30 yd^3 was rebar.

Air monitoring was performed during the remedial action at the site. A total of 56 air samples were collected during 12 24-hour periods using air monitoring equipment installed at the four corners of the site. These samples were analyzed for lead and particulate mass. Laboratory analysis of the air samples indicated that lead mass concentrations did not exceed the National Ambient Air Quality Standard (NAAQS) of 1.5 micrograms per cubic meter ($\mu g/m^3$) except in one sample collected on July 30, 1999. In addition, particulate mass concentrations did not exceed the NAAQS of 150 $\mu g/m^3$ for particles less than 10 microns in size except in one sample collected on July 22, 1999.

The final confirmation soil samples collected from the on-site unpaved areas and UST excavations contained total lead concentrations ranging from 4.5 to 1,700 mg/kg. Of the 51 final confirmation samples collected from the unpaved areas, one sample (CS-038) contained a total lead concentration exceeding 400 mg/kg, the IEPA TACO Tier 1 soil remediation objective for industrial-commercial scenarios. Of the 17 final confirmation samples collected from the UST areas, three samples (UST-001, UST-004, and UST-017) contained total lead concentrations exceeding 400 mg/kg.

2.2.1.2 On-Site Paved Areas

A total of 3,232 square yards of concrete was removed, cleaned, and stockpiled on site, and 3,074 tons of lead-impacted soil was excavated from the formerly paved areas and stockpiled on site. A total of 46 confirmation soil samples were collected from the excavations and analyzed for total lead; the sample analytical results indicated that total lead concentrations did not exceed the U.S. EPA risk-based cleanup goal of 1,400 mg/kg. A total of 22 soil samples were collected from the soil stockpiles and analyzed for TCLP lead. The sample from one soil stockpile contained a TCLP lead extract concentration that did not exceed the RCRA regulatory limit of 5 mg/L; therefore, the 120 tons of soil in this stockpile did not require treatment. The samples collected from the remaining 21 soil stockpiles contained TCLP lead extract concentrations ranging from 26 to 288 mg/L; thus, the 2,955 tons of soil in these 21 stockpiles was treated by stabilization. Samples collected from the treated soil stockpiles contained TCLP lead extract concentrations that did not exceed the RCRA regulatory limit of 5 mg/L; thus, the treated soil was transported off site and disposed of as nonhazardous waste.

A total of 2,506 yd^3 of backfill was placed and compacted in the formerly paved areas on site, and 0.61 acre of the site was seeded and mulched. Excavation depths ranged from 0.5 to 7.5 feet bgs in the formerly paved areas.

The final confirmation samples collected from the excavations contained total lead concentrations ranging from 11.4 to 1,100 mg/kg. Of the 25 final confirmation samples, 5 samples contained total lead concentrations exceeding 400 mg/kg, the IEPA TACO Tier 1 soil remediation objective for industrial-commercial scenarios. These 5 samples were collected at the following locations: CSP-3A (567 mg/kg), CSP-8A (727 mg/kg), CSP-10 (1,100 mg/kg), CSP-11 (991 mg/kg), and CSP-23A (625 mg/kg).

2.2.1.3 Off-Site Parkway Areas

ESC excavated and stockpiled 1,047 tons of lead-impacted soil from the off-site parkway areas. A total of 10 confirmation soil samples were collected from the excavated areas and analyzed for total lead. The total lead concentrations detected in these samples did not exceed the U.S. EPA risk-based cleanup goal of 1,400 mg/kg. Six stockpiles of untreated parkway soil were sampled for TCLP lead analysis. Three of the stockpiles contained TCLP lead extract concentrations that did not exceed the RCRA regulatory level of 5 mg/L; therefore, the 409 tons of soil in these stockpiles was not treated. The remaining three stockpiles contained TCLP lead extract concentrations ranging from 6.6 to 31.2 mg/L. The soil in these stockpiles was treated by stabilization. The treated soil was sampled, and the samples contained TCLP lead extraction concentrations below the RCRA regulatory level of 5 mg/L. A total of 637 tons of soil and 20 tons of reagent were transported off site for disposal as nonhazardous waste. A total of 700 yd^3 of backfill material was placed and compacted in the off-site parkway areas, and the areas were seeded and mulched. Excavation depths in these areas ranged from 1 to 2 feet bgs.

The final confirmation samples collected from the off-site parkway area excavations contained total lead concentrations ranging from 6.0 to 1,080 mg/kg. Of the 10 final confirmation samples, one sample (CS-056) contained a total lead concentration exceeding 400 mg/kg, the IEPA TACO Tier 1 soil remediation objective for industrial-commercial scenarios.

2.2.2 CDOE-Implemented Remedial Actions

On behalf of CDOE, Earth Tech, Inc. (Earth Tech), conducted a Phase III removal action at the site from July 11, 2000, to February 13, 2001. The removal action involved three major tasks: (1) surface debris removal; (2) asbestos and water removal in basements; and (3) concrete removal, excavation and disposal of lead-contaminated soil, and backfilling. Under Task 1, Earth Tech removed two surficial debris piles; 1,119 tons of concrete; 52 tons of railroad ties; and 41 tons of miscellaneous wastes.

Task 2 was broken down into five subtasks: (1) dewatering, (2) an asbestos survey, (3) asbestos abatement, (4) AST removal, and (5) sludge removal and disposal. Earth Tech pumped 300,800 gallons of water from the tank basement, north corridor basement, and west basement for off-site treatment and disposal. An asbestos survey conducted on July 18, 2000, revealed the presence of ACM on piping in the central and west pipe tunnels. A total of 579 linear feet of pipe insulation and 2.9 tons of surficial wastes containing ACM were removed and disposed of. Six ASTs were removed from the tank and west

basements. The four tanks in the tank basement contained water and residual resins that were found to be hazardous based on their flashpoint. A total of 22,500 gallons of nonhazardous wastewater was removed for off-site disposal. The resins were transferred from the tanks into 32 55-gallon drums that were transported off site and disposed of as hazardous waste. A total of 830 tons of sludge from the sludge basement was solidified and sent off site for treatment and disposal.

Under Task 3, Earth Tech demolished the concrete foundation above each of the basements. Concrete flooring, interior basement walls, and foundation supports were demolished to 2 feet below grade. A total of 1,345 tons of concrete was hauled off site. Additional concrete was used to fill the sludge basement and west basement areas. Concrete slabs lying at grade with no voids beneath them were broken to allow drainage and were left in place. Foundry sand discovered beneath the north and southwest slabs was used to solidify sludge. About 383 tons of excess foundry sand and 82 tons of lead-contaminated soil mixed with broken concrete, bricks, and metal were transported off site for treatment and disposal.

In October 2000, during excavation in support of infrastructure improvements in the northeast corner of the site, 400 tons of contaminated soil was removed and sampled for landfill disposal. Belowground vaults and a former blast furnace were discovered in this area. Tetra Tech conducted focused sampling in a 100- by 60-foot grid area in the northeast corner of the site to determine the extent of elevated lead concentrations. Tetra Tech collected a total of 24 soil samples from eight locations; at each location, samples were collected from 0 to 2, 2 to 3, and 3 to 4 feet bgs. The samples were analyzed for total lead, and if a sample's total lead concentration was greater than 400 mg/kg, the sample was analyzed for TCLP lead. Of the 24 samples analyzed, 5 samples had total lead concentrations greater than 400 mg/kg. Of those 5 samples, 3 samples had TCLP lead extract concentrations exceeding 5 mg/L. As a result of these findings, about 800 tons of soil was stabilized on site and then removed and disposed of as special waste at CID Landfill in Calumet City, Illinois.

Confirmatory soil sampling was conducted after the soil removal in the northeast corner of the site. Sample analytical results indicated that the soil containing lead concentrations in excess of 400 mg/kg was removed. One sample collected from the south excavation wall contained 1,500 mg/kg total lead and 17 mg/L TCLP lead.

2.3 SITE HISTORY

The history of the site property was researched through review of (1) Sanborn Maps dated 1911, 1939, 1950, 1975, 1987, and 1993 and (2) previous investigation reports. Figure A-1 shows the site location, and Figure A-2 is a site map that includes overlays of the Sanborn Map information.

The 1911 Sanborn Map shows the east part of the site property as being occupied by the Carter White Lead Company. Building 11 was an oil house, east of the building was a reservoir, and north of the building was a stack. An underground cistern was present north of the reservoir. A second oil house, also labeled Building 11, was on the south side of the area next to the railroad tracks. Building 12 was an oil refinery. Railroad spurs crossed the property. A corroding house, wash house, engine room, mill house, blow house, and warehouse were present in the central portion of the property. The east portion of the property was unpaved and undeveloped except for a small office in the southeast portion of the property. Small buildings were present in the southwest portion of the property and are labeled as a shed, a bath house, and a carpenter shop.

The 1939 Sanborn Map shows the company name as having changed to National Lead, Carter Branch. Both oil houses are shown, but the south oil house is relabeled as Building 10. The corroding house extends to the east side of the property. The mill house and wash house are larger, and a machine shop overlies the former reservoir area. The engine room is larger and extends over the former cistern. Some additional buildings are present in the southwest portion of the property. The railroad spurs remain.

The 1950 Sanborn Map does not show Building 10. Seven linseed oil tanks are shown at the west boundary of the site. New structures have been added to the southwest portion of the property. The 1975 Sanborn Map shows several ASTs adjacent to and west of the oil house. The 1987 Sanborn Map shows the site property as being vacant. The 1993 Sanborn Map shows the property as being vacant except for concrete ruins along South Peoria Street.

2.4 SITE DESCRIPTION

The site is located from 12000 to 12054 South Peoria Street and from 901 to 935 West 120th Street in Chicago, Cook County, Illinois, as shown in Figure A-1. The site covers 5.2 acres in a primarily industrial area. The site is bounded on the north by West 120th Street, on the east by South Peoria Street, on the south by Illinois Central Gulf Railroad tracks, and on the west by the International Harvester site.

No standing buildings remain at the site, and many of the concrete slab foundations that covered much of the site have been removed. Currently, approximately 20 percent of the site is concrete-covered, and the remaining 80 percent is soil-covered.

2.4.1 Topography

A U.S. Geological Survey (USGS) map shows the elevation of the site as being approximately 610 feet above mean sea level (USGS 1984). The contours on the map indicate that the site is generally flat and that the site area's topography slopes gently downward to the south toward the Little Calumet River, which is more than 1 mile from the site. The site is not located within a 100-year or 500-year flood plain.

2.4.2 Geology

The surface features of the Chicago area are largely the result of glaciation. Glacial deposits almost completely mask a bedrock surface on which glacial and stream erosion produced a relief and roughness comparable to those of the present surface. The site area lies in the Chicago Lake Plain section, which primarily consists of floors of glacial lakes flattened by wave erosion and by minor deposition in low areas. Glacial till and thin deposits of silt, clay, and sand of the Equality Formation largely underlie the region.

2.4.3 Hydrogeology

Three aquifer systems are typically present in the site areas: the unconsolidated glacial deposits, the Silurian dolomite, and the deep Ordovician-Cambrian sandstone. Groundwater can be found in the sand and gravel portions of the glacial drift.

Potable water for the site area is provided by the City of Chicago municipal water system, which draws its water from Lake Michigan. No potable groundwater aquifers exist in Chicago, and no potable water supply wells are expected to be installed. Furthermore, a memorandum of understanding issued by the City of Chicago prohibits use of existing groundwater wells to obtain potable water and prohibits installation of new potable water supply wells.

2.5 SITE MAPS

Figure A-1 in Appendix A is a site location map. Figure A-2 shows site features and areas of environmental concern. Figure A-3 shows CSI sampling locations. Figures A-4a and A-4b show geologic cross sections A-A' and B-B', respectively. Figure A-5 is a potentiometric surface map showing groundwater flow and groundwater elevations measured on May 24, 2001. Figures A-6 through A-12 respectively show soil sample analytical results exceeding TACO Tier 1 remediation objectives for arsenic, lead, other metals, SVOCs, VOCs, and PCBs and herbicides. Figure A-13 shows groundwater sample analytical results exceeding TACO Tier 1 remediation objectives.

3.0 SITE-SPECIFIC SAMPLING PLAN

Tetra Tech designed the field sampling plan for the CSI (1) to meet IEPA's SRP requirements and (2) to collect data needed to determine a remedial strategy for the site in order to allow it to be redeveloped. Field sampling activities were based on the Tetra Tech work plan dated May 25, 2001 (Tetra Tech 2001). Investigation activities included soil and groundwater sampling. The specific objectives of the field investigation were to (1) define the limits of impacts on subsurface soils, (2) assess the quality of groundwater in the perched aquifer beneath the site based on groundwater remediation objectives, and (3) assess the quality of site soil in terms of industrial-commercial and construction worker scenarios and groundwater migration routes. All sampling and analyses were performed in accordance with the Tetra Tech work plan. Section 3.1 discusses soil boring and sampling locations. Section 3.2 discusses groundwater sampling locations.

3.1 SOIL BORING AND SAMPLING LOCATIONS

Because CDOE does not intend to rely on engineered barriers at the site, and because the future use of the site property is not known, Tetra Tech developed a sampling plan to evaluate the remediated and unremediated portions of the site from 0 to 10 feet bgs in accordance with SRP requirements. The sampling locations were selected to evaluate each 0.5 acre of the site as well as areas suspected to have environmental impacts based on Sanborn Map information. Samples were collected and submitted for laboratory analysis to evaluate the inhalation, ingestion, and soil components of the groundwater migration route exposure pathways. In addition, samples of groundwater were collected to evaluate the direct groundwater ingestion exposure pathway.

Soil borings were advanced to 10 feet bgs unless Geoprobe refusal occurred above 10 feet bgs. For each boring, the soil samples collected from 0- to 3-foot bgs and 3- to 10-foot-bgs intervals were analyzed for VOCs, SVOCs, TPP metals, pH, and moisture content to assess the ingestion, inhalation, and migration to groundwater exposure routes. One soil sample collected from the railroad spur area was analyzed for herbicides in addition to the above-mentioned analytes. Soil samples collected from the oil house, oil refinery, engine room, and reservoir areas were analyzed for PCBs in addition to the above-mentioned analytes. Two soil samples collected from the above-grade concrete loading dock area were analyzed for GRO/DRO. Following Tetra Tech's receipt of the total lead analytical results, Tetra Tech had the three

soil samples with the highest total lead concentrations analyzed for TCLP lead. Table B-1 summarizes the soil sampling and analysis approach. Figure A-3 shows the soil sampling locations.

3.2 GROUNDWATER SAMPLING LOCATIONS

Tetra Tech installed three temporary groundwater sampling points at the site to obtain depth-to-water information, determine the groundwater flow direction, and assess groundwater quality in the perched aquifer beneath the site. The temporary sampling points were located in areas exhibiting obvious signs of contamination or in identified source areas (see Figure A-3). The temporary sampling points were installed within additional soil borings that were prepunched with a direct-push tool.

The temporary groundwater sampling points were constructed of 1-inch-inside diameter, schedule 40 polyvinyl chloride risers and 0.010-inch slotted screens. The top of the casing for each point was surveyed relative to a city datum, and the depth to water at each point was gauged in order to calculate the groundwater flow direction and groundwater gradient at the site.

Groundwater samples were collected from the three temporary sampling points for VOC, SVOC, and TPP metals analyses. Tables B-1 and B-2 summarize the groundwater sampling and analysis approach.

4.0 DOCUMENTATION OF FIELD ACTIVITIES

This section describes CSI field activities, reviews quality assurance and quality control (QA/QC) activities, and discusses data presentation.

4.1 FIELD ACTIVITIES

Tetra Tech conducted CSI field activities at Study Area No. 13 from May 21 through 24, 2001. Field activities included advancing soil borings, collecting soil samples, installing temporary monitoring wells, collecting groundwater samples, and measuring groundwater elevations. The following sections discuss Tetra Tech's soil and groundwater sampling activities.

4.1.1 Soil Sampling Activities

Soil borings were advanced using a truck-mounted, direct-push mechanism and decontaminated, 4-foot-long macrosamplers with dedicated polybutyl acetate liners. Each soil boring was continuously advanced to 8 feet bgs in order to define the vertical extent of the groundwater table. Soil samples were retrieved from the macrosampler and sliced longitudinally. At soil borings where samples were collected for VOC analysis, EnCore® samplers were used. No headspace readings were collected because of a photoionization detector malfunction. Encore® samples for VOC analysis were collected from areas displaying discoloration or from the layer of soil most representative of a given area. At soil borings where samples were collected for SVOC, metal, herbicide, GRO/DRO and PCB analyses, soil samples from either the 0- to 3-foot bgs interval or the 3- to 8-foot bgs interval were composited. Samples were then labeled and placed on ice for delivery to Severn Trent Laboratories (STL; formerly Quanterra Incorporated) in University Park, Illinois.

As discussed in Section 3.1, soil samples were collected for VOC, SVOC, TPP metal, pH, TCLP lead, total lead, PCB, herbicide, GRO/DRO and moisture content analyses to assess the inhalation, ingestion, and migration to groundwater exposure routes. Tetra Tech collected 108 investigative soil samples from 31 soil borings and two surface locations to assess the presence and extent of contamination in these areas. Soil boring locations are shown in Figure A-3. Table B-1 summarizes the numbers and types of investigative and QC samples collected.

4.1.2 Groundwater Sampling Activities

Three temporary groundwater monitoring wells were constructed of 1-inch-inside diameter, schedule 40 polyvinyl chloride risers and 0.010-inch slotted screens fitted with silt filter socks. The top of the casing for each temporary monitoring well was surveyed relative to a city datum, and the depth to groundwater at each location was gauged in order to calculate the groundwater flow direction and hydraulic gradient. The well screens of the three temporary groundwater sampling wells were located from 4 to 9 feet bgs, and the wells were installed in areas suspected to be source areas. The locations of the three temporary groundwater monitoring wells are shown in Figure A-3. Table B-2 summarizes the groundwater sampling and analysis approach for the site. The temporary groundwater monitoring wells will remain in place until site closure is obtained. At that time, they will be removed, and the borings will be backfilled with bentonite.

Prior to groundwater sample collection, the temporary groundwater monitoring wells were screened for free product. No free product was encountered during the investigation. Groundwater samples were collected from temporary monitoring wells TMW-1, TMW-2, and TMW-3. The wells were purged using a low-flow peristaltic pump with dedicated tubing to minimize the turbidity of the groundwater samples. The samples were then collected at a low flow rate in pre-preserved glass vials, plastic bottles, or glass bottles with Teflon®-lined lids. The samples were properly labeled, placed on ice, and hand-delivered to STL.

4.2 QA/QC ACTIVITIES

Tetra Tech performed QA/QC activities in accordance with the CSI work plan for the site (Tetra Tech 2001). QA/QC sampling activities and data validation procedures are discussed below.

4.2.1 QA/QC Sampling Activities

Field duplicate samples and matrix spike (MS) and matrix spike duplicate (MSD) samples were collected and analyzed to assess the quality of data generated by the field sampling program. Field duplicate samples were collected for analysis for VOCs and SVOCs in soil to check sampling and analytical reproducibility. Two MS/MSD sample pairs were collected for analysis for VOCs, SVOCs, PCBs, and herbicides in soil to obtain information on the effect of the sample matrix on the digestion and

measurement methodologies used for the investigation. For each analytical parameter, Tetra Tech collected one additional sample volume for one MS/MSD analysis.

Tetra Tech also collected equipment blank samples for analysis for VOCs, SVOCs, PCBs, herbicides, and TPP metals to evaluate the potential for cross-contamination from sample collection equipment.

Tetra Tech included a trip blank with each sample shipment. Trip blank and method blank samples were analyzed to evaluate potential contamination during handling, shipping, and storage of aqueous samples to be analyzed for VOCs. Table B-1 summarizes the QC samples collected for the CSI. Standard Tetra Tech chain-of-custody procedures specified in Tetra Tech Standard Operating Procedure (SOP) No. 18, "Sample Custody," were followed to document sample possession from the time of collection to the time of disposal. The SOP specifies procedures that are consistent with U.S. EPA guidance.

4.2.2 Data Validation

IEPA's SRP requires that analytical data generated for a CSI be checked for precision, accuracy, and completeness. The SRP further requires that the remedial applicant or an authorized representative and the analytical laboratory provide sample analytical results that meet SRP precision, accuracy, and completeness objectives. To facilitate IEPA review and acceptance of laboratory analytical data, the data are being reported to IEPA in a standard format based on IEPA-defined criteria for data reduction, validation, and reporting. Guidance concerning these criteria is provided in IEPA's "Analytical Quality Assurance Plan, Revision 2" (IEPA 1996).

Tetra Tech reviewed all the data generated during the CSI to determine whether (1) the data were reportable, (2) any data were outliers, and (3) additional samples should be collected. Also, the data validation process was conducted to determine whether the laboratory data met project requirements. In addition, the data validation process included a review of laboratory procedures and performance reports for samples analyzed to determine whether the analyses were performed in accordance with the requirements of prescribed methods and the laboratory's internal QA/QC procedures.

In general, soil and groundwater samples collected during the May 2001 sampling event at the site were analyzed for VOCs, SVOCs, TPP metals, PCBs, herbicides, pH, and other parameters. STL analyzed all the soil and groundwater samples. STL reduced and validated the analytical results in accordance with

IEPA's laboratory data reduction and validation procedures. Tetra Tech also evaluated and validated the data in accordance with IEPA and U.S. EPA guidance.

Appendix C presents the results of Tetra Tech's data validation. Based on the validation, all the analytical results are acceptable. However, in some cases, validation criteria were not met. In these cases, the data were appropriately qualified, and the values should be viewed as estimated.

4.3 DATA PRESENTATION

Appendix A contains the following figures:

- A-1 Site Location Map
- A-2 Site Features and Areas of Environmental Concern
- A-3 Sampling Locations
- A-4a Geologic Cross Section A-A'
- A-4b Geologic Cross Section B-B'
- A-5 Potentiometric Surface Map
- A-6 Arsenic Samples Exceeding TACO Tier 1 Remediation Objectives
- A-7 Lead Samples Exceeding TACO Tier 1 Remediation Objectives
- A-8 TCLP Lead Samples Exceeding TACO Tier 1 Remediation Objectives
- A-9 Other Metal Samples Exceeding TACO Tier 1 Remediation Objectives
- A-10 SVOC Samples Exceeding TACO Tier 1 Remediation Objectives
- A-11 VOC Samples Exceeding TACO Tier 1 Remediation Objectives
- A-12 PCB and Herbicide Samples Exceeding TACO Tier 1 Remediation Objectives
- A-13 Groundwater Samples Exceeding TACO Tier 1 Remediation Objectives

Appendix B contains the following tables:

- B-1 Numbers and Types of Investigative and QC Samples Collected
- B-2 Groundwater Sampling and Analysis Approach
- B-3 Groundwater Elevations on May 24, 2001
- B-4a Summary of Soil Sample Analytical Results - VOCs
- B-4b Summary of Soil Sample Analytical Results - SVOCs

- B-4c Summary of Soil Sample Analytical Results - TPP Metal, and Classical Chemistry
- B-4d Summary of Soil Sample Analytical Results - PCBs and Herbicides
- B-4e Summary of Soil Sample Analytical Results - GRO/DRO
- B-5 Summary of Groundwater Sample Analytical Results
- B-6 Samples Exceeding TACO Tier 1 Remediation Objectives

The site geology and hydrogeology are discussed below based on CSI findings and the results of previous investigations.

4.3.1 Site Geology

CSI findings indicate that the site is underlain by fill, sand, silt, clay, and mixtures of these materials. The site lithology varies greatly and shows no discernible trends. The variety of the subsurface materials may be due to various excavation and backfilling activities throughout the site's history. The sand layers encountered were discontinuous across the site and reached thicknesses of up to 10 feet. In most cases, areas previously remediated were backfilled with sand. Most of the CSI soil borings were completed in clay or silty clay. Figures A-4a and A-4b show geologic cross sections of Study Area No. 13.

Tetra Tech drilled three soil borings in the West Pullman Industrial Redevelopment Area in June 1999. Soil boring SB-1 was drilled to a depth of 49 feet bgs in the northwest corner of the Study Area No. 3 property, soil boring SB-2 was drilled to a depth of 33 feet bgs in the southeast portion of Study Area No. 10, and soil boring SB-3 was drilled to a depth of 21 feet bgs in Study Area No. 14.

Data for the three soil borings indicate that fill materials were present from the ground surface to depths of about 4 feet bgs. In SB-1, the fill material was underlain by alternating layers of silty clay and clayey silt extending to the bottom of the soil boring. A 2-inch layer of sand and gravel was present 14 feet bgs, a 3-inch layer of saturated sand with gravel was present 31 feet bgs, and a 2-inch layer of sand with traces of gravel was present 35.5 feet bgs. In SB-2, the fill material was underlain by alternating layers of silty clay and clayey silt extending to the bottom of the soil boring. A 1-inch layer of saturated sand was present 11.5 feet bgs, a 2-inch layer of saturated gravel was present 13.5 feet bgs, a 4-foot layer of saturated sandy silt was present 25 feet bgs, and a 1-foot layer of saturated sand and gravel was present 29 feet bgs. In SB-3, the fill material was underlain by 6 feet of silty sand and 11 feet of silty clay.

Layers of saturated sand with thicknesses of 3, 4, and 2 inches were present 11, 14, and 16 feet bgs, respectively.

4.3.2 Site Hydrogeology

Data for soil borings advanced during the CSI indicate that groundwater is perched and not continuous beneath the site. Perched groundwater was present in the fill material, the sand seams, and the silty clay beneath the site. Temporary monitoring wells TMW-1, TMW-2, and TMW-3 were installed to assess groundwater quality and to collect groundwater flow data. Depth-to-groundwater data collected on May 24, 2001, indicate that groundwater was present at depths ranging from 4.2 to 8.5 feet bgs.

The perched groundwater appears to lie within 10 feet of the ground surface at the site. According to the May 24, 2001, data, the groundwater flow direction in the perched zone is to the east. Table B-3 summarizes the groundwater elevation data. Figure A-5 is a potentiometric surface map of groundwater flow at the site based on the May 24, 2001, data.

The presence of the perched groundwater zone within 10 feet of the ground surface and the low permeability of the saturated materials indicate that groundwater beneath Study Area No. 13 may be classified as Class II groundwater. Because of the presence of about 46 feet of silty clay and clayey silt beneath the West Pullman Industrial Redevelopment Area, CDOE will not investigate deeper groundwater zones beneath Study Area No. 13.

5.0 ENDANGERMENT ASSESSMENT

This section summarizes the nature and extent of contaminants of concern at the site based on field observations and chemical analyses of samples collected during the field investigation. Analytical data were screened in accordance with TACO regulations. The TACO regulations established a three-tiered screening process to evaluate and develop remediation objectives based on risks to human health and the environment and on future site uses. For Tier 1, chemical concentrations are compared to standard IEPA objectives presented in tables. These objectives are conservative because no site-specific information is factored into their development and because conservative default assumptions are made with regard to ingestion and inhalation exposure routes and exposure durations.

The following sections discuss (1) recognized environmental conditions at the site; (2) the nature, concentration, and extent of contamination; (3) physical features that affect contaminant transport; and (4) the comparison of contaminant concentrations to TACO Tier 1 remediation objectives.

5.1 ENVIRONMENTAL CONDITIONS

Recognized environmental conditions documented during previous site investigations include soils contaminated with lead and petroleum hydrocarbons. During a 1987 field investigation, Toxcon identified lead concentrations in site soils ranging from 11,400 to 50,000 mg/kg. During a 1995 site investigation conducted for U.S. EPA, lead concentrations identified in site soils ranged from 1,540 to 31,700 mg/kg. During a 1997 EOC survey conducted by Environ, soils near the railroad spur were found to contain lead concentrations ranging from 5,000 to 10,000 mg/kg. Also identified during the EOC survey were soils containing petroleum hydrocarbons in the immediate vicinity of an AST (ESC, 1999e).

From July 2000 to February 2001, Earth Tech conducted a removal action at the site on behalf of CDOE. The removal action involved surface debris removal; asbestos and water removal in basements; and concrete removal, excavation and disposal of lead-contaminated soil, and backfilling. In October 2000, Tetra Tech conducted site remediation activities in the northeast corner of the site. Tetra Tech stabilized approximately 800 tons of lead-contaminated soil at the site. The soil was then removed and disposed of as special waste at CID Landfill in Calumet City, Illinois.

5.2 NATURE, CONCENTRATION, AND EXTENT OF CONTAMINATION

This section discusses the nature, concentration, and extent of contaminants of concern at the site. Soil and groundwater samples were collected for VOC, SVOC, TPP metal and total lead, PCB, herbicide, pH, and other analyses. Soil and groundwater sample analytical results are discussed below.

5.2.1 Soil Sample Analytical Results

Soil sample analytical results for VOCs, SVOCs, TPP metal and total lead, PCBs and herbicides are discussed below and are respectively summarized in Tables B-4a through B-4e. Figures A-6 through A-12 show soil sampling locations whose analytical results exceeded TACO Tier 1 remediation objectives. Analytical results for soil samples collected in July 1999 at soil boring locations SB-1 through SB-5 were also compared to the TACO Tier 1 remediation objectives used to evaluate the samples collected during the May 2001 field investigation. The laboratory data packages are provided in Attachment B.

5.2.1.1 VOCs

A total of 54 investigative soil samples, including 10 collected in July 1999, and 4 duplicate samples were analyzed for VOCs. Trace concentrations of VOCs were detected in 37 of the investigative soil samples. Three samples had concentrations of VOCs that exceeded Class I migration to groundwater remediation objectives. Significant sample analytical results are summarized below.

- In sample SB-9-37, 1,2-dichloropropane exceeded the Class I migration to groundwater remediation objective of 0.03 mg/kg with an estimated concentration of 0.045 mg/kg.
- Benzene exceeded the Class I migration to groundwater remediation objective of 0.03 mg/kg in samples SB-19-45 and SB-32-03 with estimated concentrations of 0.035 and 0.14 mg/kg, respectively.
- Toluene exceeded the Class I migration to groundwater remediation objective of 12 mg/kg in sample SB-32-03 with a concentration of 21 mg/kg.
- In one sample, SB-32-37, benzene exceeded the Class II migration to groundwater remediation objective of 0.17 mg/kg with a concentration of 0.18 mg/kg.

No VOC concentrations exceeded the TACO Tier 1 industrial-commercial or construction worker soil ingestion or inhalation exposure route objectives.

5.2.1.2 SVOCs

A total of 51 investigative soil samples, including 10 collected in July 1999, and 4 duplicate samples were analyzed for SVOCs. Trace concentrations of SVOCs were detected in 20 of the investigative soil samples. Four soil samples had concentrations of SVOCs that exceeded TACO remediation objectives. Significant sample analytical results are summarized below.

- In sample SB-15-03, benzo(a)pyrene exceeded the industrial-commercial soil ingestion exposure route objective with a concentration of 1 mg/kg.
- In sample SB-15-35, benzo(a)anthracene at a concentration of 14 mg/kg exceeded the Class I and II migration to groundwater remediation objectives of 2 and 8 mg/kg, respectively, and the industrial-commercial soil ingestion exposure route objective of 8 mg/kg.
- In sample SB-15-35, benzo(b)fluoranthene exceeded the Class I migration to groundwater remediation objective of 5 mg/kg and the industrial-commercial soil ingestion exposure route objective of 8 mg/kg with a concentration of 12 mg/kg; benzo(a)pyrene exceeded the Class I migration to groundwater remediation objective of 8 mg/kg and the industrial-commercial soil ingestion exposure route objective of 0.8 mg/kg with a concentration of 13 mg/kg; dibenzo(a,h)anthracene exceeded the industrial-commercial soil ingestion exposure route objective of 0.8 mg/kg with a concentration of 1.9 mg/kg; carbazole exceeded the Class I and II migration to groundwater remediation objectives of 0.6 and 2.8 mg/kg, respectively, with a concentration of 3.0 mg/kg.
- In sample SB-17-36, benzo(a) pyrene exceeded the industrial-commercial soil ingestion exposure route objective of 0.8 mg/kg with a concentration of 0.96 mg/kg.
- In sample SB-27-03, benzo(a)anthracene exceeded the Class I migration to groundwater remediation objective of 2.0 mg/kg with an estimated concentration of 2.1 mg/kg, and benzo(a)pyrene exceeded the industrial-commercial soil ingestion exposure route objective of 0.8 mg/kg with an estimated concentration of 1.7 mg/kg.

No SVOC concentrations exceeded TACO Tier 1 industrial-commercial soil inhalation exposure route objectives or construction worker soil ingestion or inhalation exposure route objectives.

5.2.1.3 TPP Metals

Of the investigative soil samples collected in May 2001, 41 were analyzed for TPP metals and 7 were analyzed for total lead. Four duplicate samples were also collected and analyzed for TPP metals. Of the investigative soil samples collected in July 1999, 10 were analyzed for TPP metals and 5 were analyzed for total lead. Metals were detected in all the soil samples analyzed.

Total metal concentrations were compared to TACO Tier 1, Part 742, Appendix B, Table C, pH-specific soil remediation objectives for inorganics for the soil component of the groundwater ingestion route for Class I and II groundwater. No pH-specific soil remediation objectives for pH values greater than 8.0 are listed in the TACO regulations; therefore, for samples that had a pH greater than 8.0, the soil remediation objectives listed for the pH values from 7.75 to 8.0 were used. Two soil samples contained metal concentrations exceeding the pH-specific soil remediation objectives for the soil component of the groundwater ingestion route for Class I groundwater. One soil sample contained a metal concentration exceeding the pH-specific soil remediation objective for the soil component of the groundwater ingestion route for Class I and II groundwater.

Total metal concentrations were also compared to TACO Tier 1, Part 742, Appendix B, Table B soil remediation objectives for the ingestion and inhalation exposure routes for industrial-commercial properties. Tetra Tech's findings for arsenic, lead, and other metals are discussed below.

Arsenic

A total of 54 soil samples, including duplicate samples and samples collected in July 1999, contained arsenic concentrations exceeding the industrial-commercial ingestion exposure route remediation objective of 3 mg/kg. In addition, 1 soil sample contained an arsenic concentration that exceeded the pH-specific Class I soil component of the groundwater ingestion exposure route objective of 31 mg/kg; specifically, sample SB-30-03 had an arsenic concentration of 38.9 mg/kg. The arsenic concentrations in the soil samples ranged from 2.3 to 38.9 mg/kg. The construction worker ingestion and inhalation exposure route soil remediation objectives for arsenic were not exceeded, and the industrial-commercial inhalation exposure route soil remediation objective for arsenic was not exceeded. Six samples contained arsenic concentrations exceeding the TACO background concentration for metropolitan areas of 13 mg/kg.

Lead

A total of 12 soil samples, including 2 collected in July 1999, contained lead concentrations that exceeded the industrial-commercial and construction worker soil ingestion exposure route remediation objective of 400 mg/kg. Lead concentrations in the soil samples ranged from 2.6 to 143,000 mg/kg. In addition, 3 soil samples were analyzed for TCLP lead. The TCLP lead extract concentrations ranged

from 14.8 to 128 mg/L, exceeding the Class I and Class II soil migration to groundwater remediation objectives of 0.0075 and 0.1 mg/L, respectively.

Other Metals

Significant soil sample analytical results for various metals are summarized below.

- One sample, SB-30-03, contained an antimony concentration of 45.9 mg/kg, exceeding the pH-specific Class I and II soil component for ingestion of groundwater remediation objective of 5 and 20 mg/kg, respectively.
- In samples SB-7-03 and SB-20-35.5, beryllium exceeded the industrial-commercial ingestion exposure route remediation objective of 1 mg/kg with a concentration of 1.1 mg/kg.
- In sample SB-11-03, mercury exceeded the pH-specific soil remediation objective for the Class I soil component for ingestion of groundwater of 0.01 mg/kg with an estimated concentration of 0.043 mg/kg.
- In sample SB-30-03, selenium exceeded the pH-specific Class I and II soil component for ingestion of groundwater remediation objective of 2.4 mg/kg with a concentration of 4.9 mg/kg.

No cadmium, chromium, copper, nickel, silver, thallium, or zinc concentrations exceeded (1) the pH-specific remediation objectives for the soil component of the groundwater ingestion exposure pathway or (2) ingestion or inhalation exposure route remediation objectives for the industrial-commercial or construction worker scenario. No remediation objectives have been established for some metals.

5.2.1.4 PCBs and Herbicides

A total of 13 investigative soil samples were analyzed for PCBs, and 2 investigative soil samples were analyzed for herbicides. One sample's PCB concentration exceeded the industrial-commercial and construction worker soil ingestion exposure route remediation objective of 1 mg/kg. Specifically, sample SB-26-03 had an Aroclor 1260 concentration of 1.2 mg/kg. Herbicides were not detected in the 2 soil samples analyzed for them.

5.2.1.5 GRO/DRO

A total of 4 investigative soil samples were analyzed for GRO/DRO. One sample's GRO/DRO concentration exceeded the TACO Tier 1 remediation objective of 2,000 mg/kg for soil attenuation capacity below one meter of the ground surface. Specifically, sample SB-32-37 had a GRO/DRO concentration of 4,005.2 mg/kg. The GRO/DRO concentrations detected in the other 3 samples were below the remediation objectives.

5.2.2 Groundwater Sample Analytical Results

Groundwater sample analytical results for VOCs, SVOCs, and TPP metals are discussed below and are summarized in Table B-5. Figure A-13 shows groundwater sampling locations whose analytical results exceeded TACO Tier 1 remediation objectives. Laboratory data packages are provided in Attachment B.

Trace concentrations of VOCs and SVOCs were detected in groundwater samples; however, the concentrations did not exceed TACO Tier 1 Class I groundwater remediation objectives except for naphthalene, which exceeded the remediation objective of 0.025 mg/L with a concentration of 0.026 mg/L. Lead concentrations exceeded the Class I groundwater remediation objective of 0.0075 mg/L in three samples and the Class II groundwater remediation objective of 0.1 mg/L in one sample. Nickel concentrations exceeded the Class II groundwater remediation objective of 0.05 mg/L in two samples. Specifically, sample TMW-1 contained lead and nickel concentrations of 0.0741 and 0.0577 mg/L, respectively; sample TMW-2 contained lead and nickel concentrations of 0.397 and 0.141 mg/L, respectively; and sample TMW-3 contained a lead concentration of 0.0652 mg/L.

5.3 PHYSICAL FEATURES AFFECTING CONTAMINANT TRANSPORT

Physical features of the site that may contribute to contaminant transport and to risks to human health, public safety, and the environment are discussed below.

The chemicals present at the site whose concentrations exceed TACO Tier 1 remediation objectives for the ingestion and inhalation exposure routes are lead, SVOCs, and Aroclor 1260. These chemicals are relatively immobile and will not readily migrate. Furthermore, the contaminant concentrations exceeding TACO Tier 1 remediation objectives are located from 0 to 6 feet bgs; therefore, their vertical extent is limited.

The site geology consists of fill material, sandy soil, silty clay, and clay. Based on data for soil borings advanced in Study Areas No. 3, 6, 10, and 11 of the West Pullman Industrial Redevelopment Area, the sand unit does not appear to extend throughout the redevelopment area; therefore, horizontal migration of contaminants in groundwater would be limited.

The sandy fill material and soil at the site are underlain by a silty clay layer that begins about 9 feet bgs. Based on data for deep borings advanced by Tetra Tech, the silty clay layer is at least 11 feet thick; therefore, vertical migration of contaminants in soil and groundwater would be limited.

Groundwater is perched in the fill material at the site. Based on groundwater data collected in Study Areas No. 3, 6, 10, 11, and 13, the perched water does not extend throughout the redevelopment area; therefore, horizontal migration of groundwater contamination would be limited.

Groundwater is not used as a potable resource in the site area, and a City of Chicago ordinance prohibits use of groundwater as a source of drinking water in the city. Site groundwater is classified as Class II general resource groundwater; therefore, the potential for exposure to groundwater contaminants through ingestion is minimal.

5.4 COMPARISON OF CONTAMINANT CONCENTRATIONS TO TACO TIER 1 REMEDIATION OBJECTIVES

This section compares soil and groundwater sample analytical results to TACO Tier 1 screening levels. This comparison is the first step in the TACO three-tiered screening process. Each constituent identified at concentrations above Tier 1 screening levels will be further assessed as part of a Tier 2 or Tier 3 evaluation to determine whether it poses a potential risk to human health or the environment. Tier 2 and Tier 3 evaluations are equally protective of human health and the environment. This report discusses only Tier 1 screening evaluations; Tier 2 and Tier 3 evaluations will be conducted in the future during development of overall site management strategies.

Tetra Tech performed an endangerment assessment to compare the soil and groundwater sample analytical results to TACO Tier 1 industrial-commercial screening levels for the following exposure pathways:

- Soil component of the groundwater ingestion exposure route

- Soil ingestion exposure route for the industrial-commercial and construction worker scenarios
- Soil inhalation exposure route for the industrial-commercial and construction worker scenarios
- Groundwater exposure route for Class I and II groundwater

The industrial-commercial screening levels were applied because the future use of the site is not known. The soil component of the groundwater ingestion exposure route, soil ingestion exposure route, soil inhalation exposure route, and groundwater exposure route are discussed below. Tables B-4a through B-4e summarize soil sample analytical results, and Table B-5 summarizes groundwater sample analytical results. Table B-6 presents the numbers of soil and groundwater samples with constituent concentrations exceeding TACO Tier 1 remediation objectives. Figures A-6 through A-12 depict sampling locations whose analytical results exceeded TACO Tier 1 remediation objectives.

5.4.1 Soil Component of Groundwater Ingestion Exposure Route Screening Evaluation

The groundwater ingestion exposure route has two components: the soil to groundwater ingestion component and direct ingestion of groundwater. The soil to groundwater ingestion component exposure route has separate remediation objectives for Class I and Class II groundwater. All analytical results for soil samples collected from above the water table were used in this endangerment assessment. For discussion purposes, analytical results were compared with the soil component to groundwater ingestion exposure route remediation objectives for Class I and Class II groundwater. However, the groundwater ingestion pathway can be eliminated because of a City of Chicago ordinance that restricts municipal groundwater use provided that all provisions of 35 IAC Sections 742.320 and 742.1015 are met. This section discusses the evaluation of the soil to groundwater ingestion component. Section 5.4.4 addresses direct ingestion of groundwater.

Trace concentrations of VOCs were detected in 37 investigative soil samples; however, these concentrations did not exceed the TACO Tier 1 industrial-commercial scenario soil component of the groundwater ingestion exposure route remediation objectives for Class I and II groundwater.

Trace concentrations of SVOCs were detected in 20 investigative soil samples, including 1 sample collected in July 1999. SVOC concentrations exceeded the TACO Tier 1 Class I migration to

groundwater remediation objectives in 2 samples (SB-15-35 and SB-27-03) and the Class II migration to groundwater remediation objectives in one sample (SB-15-35).

Metals were detected in all the soil samples analyzed. Total metal concentrations were compared to TACO Tier 1, Part 742, Appendix B, Table C, pH-specific soil remediation objectives for inorganics for the soil component of the groundwater ingestion exposure route for Class I and II groundwater. No pH-specific soil remediation objectives for samples with a pH greater than 8.0 are listed in the TACO regulations; therefore, for samples that had a pH greater than 8.0, the soil remediation objectives listed for samples with pH values between 7.75 and 8.0 were used.

Of the 50 soil samples analyzed for TPP metals, 2 soil samples had metal concentrations exceeding the soil component of the groundwater ingestion exposure route remediation objectives for Class I groundwater. Specific exceedances are summarized below.

- The antimony concentration in one soil sample (SB-30-03) exceeded the Class I soil remediation objective of 5 mg/kg for a pH between 7.75 and 8.0.
- The arsenic concentration in one soil sample (SB-30-03) exceeded the Class I soil remediation objective of 31 mg/kg for a pH between 7.75 and 8.0.
- The mercury concentration in one soil sample (SB-11-03) exceeded the Class I soil remediation objective of 0.01 mg/kg for a pH between 4.75 and 5.24.
- The selenium concentration in one soil sample (SB-30-03) exceeded the Class I soil remediation objective of 2.4 mg/kg for a pH between 7.75 and 8.0.
- One soil sample (SB-30-03) contained antimony and selenium concentrations exceeding the pH-specific Class I and II soil remediation objectives of 20 and 2.4 mg/kg, respectively, for a pH between 7.75 and 8.0.

Three soil samples (SB-15-03, SB-26-03, and SB-30-03) had TCLP lead extract concentrations exceeding TACO Tier 1 migration to groundwater remediation objectives.

No groundwater ingestion exposure route remediation objectives for Class I and II groundwater have been established for PCBs.

5.4.2 Soil Ingestion Exposure Route Screening Evaluation

Because the future use of the site is not known, analytical results for soil samples collected above the water table were compared to TACO Tier 1 ingestion and inhalation exposure route soil remediation objectives for both the industrial-commercial and construction worker scenarios. Tables B-4a through B-4e summarize soil sample analytical results, and Table B-5 summarizes groundwater sample analytical results. Table B-6 presents the numbers of soil and groundwater samples with constituent concentrations exceeding TACO Tier 1 remediation objectives. Figures A-6 through A-12 depict sampling locations whose analytical results exceeded TACO Tier 1 remediation objectives. The soil samples were collected from 0 to 10 feet bgs above the water table. Soil sample results are compared to industrial-commercial and construction worker scenario soil remediation objectives below.

5.4.2.1 Industrial-Commercial Scenario

Trace concentrations of VOCs were detected in 37 soil samples; however, these concentrations did not exceed TACO Tier 1 industrial-commercial soil ingestion exposure route remediation objectives.

SVOCs were detected in 4 soil samples at concentrations exceeding the TACO Tier 1 soil ingestion exposure route remediation objectives for the industrial-commercial scenario. The specific compounds whose concentrations exceeded remediation objectives are as follows: benzo(a)anthracene in 2 samples (SB-15-35 and SB-27-03), benzo(a)pyrene in 3 samples (SB-15-03, SB-15-35, and SB-17-36), benzo(b)fluoranthene in 1 sample (SB-15-35), carbazole in 1 sample (SB-15-35), and dibenzo(a,h)anthracene in 1 sample (SB-15-35).

A total of 50 investigative soil samples, including 10 collected in July 1999, and 4 duplicate samples contained arsenic concentrations exceeding the TACO Tier 1 industrial-commercial soil ingestion exposure route remediation objective of 3 mg/kg. Seven soil samples (SB-1-02, SB-1-57, SB-2-57, SB-3-57, SB-24-36, SB-25-36, and SB-30-03) contained arsenic concentrations exceeding the IEPA background concentration for metropolitan areas of 13 mg/kg.

A total of 12 soil samples (SB-1A-2.5, SB-4-13, SB-14-03, SB-15-03, SB-15-35, SB-20-03, SB-23-03, SB-25-36, SB-26-03, SB-29-03, SB-30-03, and SB-32-03), including 2 collected in July 1999, had lead concentrations exceeding the TACO Tier 1 industrial-commercial soil ingestion exposure route remediation objective of 400 mg/kg.

No other metal concentrations exceeded TACO Tier 1 soil ingestion exposure route remediation objectives for the industrial-commercial scenario.

A total of 13 investigative soil samples were analyzed for PCBs, and 2 investigative soil samples were analyzed for herbicides. One sample (SB-26-03) contained an Aroclor 1260 concentration exceeding the TACO Tier 1 industrial-commercial soil ingestion exposure route remediation objective of 1 mg/kg. Herbicides were not detected in the 2 samples analyzed for them.

5.4.2.2 Construction Worker Scenario

Trace concentrations of VOCs were detected in 37 soil samples; however, these concentrations did not exceed TACO Tier 1 construction worker scenario soil ingestion exposure route remediation objectives.

None of the soil samples contained SVOC concentrations exceeding TACO Tier 1 soil ingestion exposure route remediation objectives for the construction worker scenario.

A total of 12 soil samples (SB-1A-2.5, SB-4-13, SB-14-03, SB-15-03, SB-15-35, SB-20-03, SB-23-03, SB-25-36, SB-26-03, SB-29-03, SB-30-03, and SB-32-03), including 2 collected in July 1999, had lead concentrations exceeding the TACO Tier 1 construction worker scenario soil ingestion exposure route remediation objective of 400 mg/kg.

One sample (SB-26-03) contained an Aroclor 1260 concentration exceeding the TACO Tier 1 construction worker scenario soil ingestion exposure route remediation objective of 1 mg/kg. Herbicides were not detected in the 2 samples analyzed for them.

5.4.3 Soil Inhalation Exposure Route Screening Evaluation

Because the future use of the site is not known, analytical results for soil samples collected above the water table were compared to TACO Tier 1 soil inhalation exposure route remediation objectives for both the industrial-commercial and construction worker scenarios. The soil samples were collected from 0 to 10 feet bgs. Soil sample analytical results are compared to industrial-commercial and construction worker scenario soil remediation objectives below.

5.4.3.1 Industrial-Commercial Scenario

Trace concentrations of VOCs were detected in 37 soil samples; however, these concentrations did not exceed the TACO Tier 1 industrial-commercial soil inhalation exposure route remediation objectives.

None of the soil samples contained SVOC concentrations exceeding TACO Tier 1 soil inhalation exposure route remediation objectives for the industrial-commercial scenario.

None of the soil samples contained TPP metal concentrations exceeding TACO Tier 1 soil inhalation exposure route remediation objectives for the industrial-commercial scenario.

No TACO Tier 1 soil inhalation exposure route remediation objectives for PCBs have been established for the industrial-commercial scenario.

5.4.3.2 Construction Worker Scenario

Trace concentrations of VOCs were detected in 37 soil samples; however, these concentrations did not exceed TACO Tier 1 construction worker scenario soil inhalation exposure route remediation objectives.

None of the soil samples had SVOC concentrations exceeding TACO Tier 1 soil inhalation exposure route remediation objectives for the construction worker scenario.

None of the soil samples contained TPP metal concentrations exceeding TACO Tier 1 soil inhalation exposure route remediation objectives for the construction worker scenario.

No TACO Tier 1 soil inhalation exposure route remediation objectives for PCBs have been established for the construction worker scenario.

5.4.4 Groundwater Exposure Route Screening Evaluation

Groundwater samples were collected from three temporary monitoring wells and were analyzed for VOCs, SVOCs, and TPP metals. The analytical results were compared to TACO Tier 1 Class I and II groundwater remediation objectives. The results of this comparison are summarized below.

- No VOC concentrations in the samples exceeded Class I or II groundwater remediation objectives.

- The sample collected from TMW-3 contained a naphthalene concentration (0.026 mg/L) exceeding the Class I groundwater remediation objective of 0.025 mg/L.

- The lead concentrations in the samples collected from TMW-1 (0.0741 mg/L), TMW-2 (0.397 mg/L), and TMW-3 (0.0652 mg/L) exceeded the Class I groundwater remediation objective of 0.0075 mg/L. The lead concentration in the sample collected from TMW-2 also exceeded the Class II groundwater remediation objective of 0.1 mg/L.

- Nickel concentrations in the samples collected from TMW-1 (0.0577 mg/L) and TMW-2 (0.141 mg/L) exceeded the Class I and Class II groundwater remediation objective of 0.05 mg/L.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Tetra Tech conducted the CSI of Study Area No. 13 in accordance with Title 35 of the IAC, Part 740, under the IEPA SRP. The objectives of the CSI were to (1) define the limits of impacts on subsurface soils, (2) assess the quality of groundwater in the perched aquifer beneath the site based on groundwater remediation objectives, and (3) assess the quality of site soil in terms of industrial-commercial and construction worker scenarios and groundwater migration routes. The CSI work plan (Tetra Tech 2001) was followed, and the CSI objectives were met.

During the CSI, constituents of environmental concern were identified in subsurface soil at the site. The concentrations of these constituents were compared to TACO Tier 1 industrial-commercial property remediation objectives for the industrial-commercial and construction worker exposure scenarios. Also, analytical results for groundwater samples collected from temporary monitoring wells at the site indicated that constituents of environmental concern were present at concentrations exceeding TACO Tier 1, Class II groundwater remediation objectives. As part of the CSI, Tetra Tech also reviewed previous site investigation data and remedial actions to further identify and evaluate remaining areas of environmental concern. The principal findings of the CSI are summarized below.

- Fill, sand, silt, and silty clay were encountered in soil borings drilled at the site during the CSI. The site lithology varies greatly, indicating that these materials are discontinuous beneath the site.
- Saturated conditions were encountered in the soil borings. A perched groundwater zone is present about 6 feet bgs at the site.
- Based on data collected on May 24, 2001, site groundwater appears to flow to the east.
- Site groundwater appears to be Class II groundwater.
- Groundwater is not used as a potable resource in the site area, and a city ordinance prohibits use of groundwater as a source of drinking water in Chicago.
- No VOCs or SVOCs were detected in groundwater samples at concentrations exceeding TACO Tier 1, Class II remediation objectives.

SVOCs, TPP metals and GRO/DRO were detected at the site at concentrations exceeding TACO Tier 1 remediation objectives or applicable regional background concentrations. These exceedances are summarized below; relevant sample numbers are presented where appropriate.

- The TACO Tier 1, Class I soil component of the groundwater migration pathway remediation objectives for the following chemicals were exceeded: 1,2-dichloropropane (SB-9-37); benzene (SB-19-45, SB-32-03, and SB-32-37); toluene (SB-32-03); benzo(a)anthracene (SB-15-35 and SB-27-03); benzo(b)fluoranthene (SB-15-35); benzo(a)pyrene (SB-15-35); carbazole (SB-15-35); mercury (SB-11-03); antimony (SB-30-03); arsenic (SB-30-03); selenium (SB-30-03); and lead (SB-15-03, SB-26-03, and SB-30-03).

- The TACO Tier 1, Class II soil component of the groundwater migration pathway remediation objectives for the following chemicals were exceeded: benzene (SB-32-37), benzo(a)anthracene (SB-15-35 and SB-27-03), carbazole (SB-15-35), antimony (SB-30-03), selenium (SB-30-03), and lead (SB-15-03, SB-26-03, and SB-30-03).

- The TACO Tier 1 soil ingestion exposure route remediation objectives for industrial-commercial properties for the following chemicals were exceeded:

- Benzo(a)anthracene:	SB-15-35
- Benzo(b)fluoranthene:	SB-15-35
- Benzo(a)pyrene:	SB-15-03, SB-15-35, SB-17-36, SB-27-03
- Dibenzo(a,h)anthracene:	SB-15-35
- Aroclor 1260:	SB-26-03
- Arsenic:	SB-1-02, SB-1-57, SB-2-13, SB-2-57, SB-3-13, SB-3-57, SB-4-13, SB-4-57, SB-5-13, SB-5-57, SB-6-03, SB-6-35, SB-7-03, SB-7-39, SB-7-39D, SB-8-03, SB-8-37, SB-9-03, SB-9-03D, SB-9-37, SB-11-03, SB-11-36, SB-14-03, SB-15-03, SB-15-35, SB-16-03, SB-16-37, SB-17-03, SB-17-36, SB-20-03, SB-20-35.5, SB-21-03, SB-21-38, SB-21-38D, SB-22-03, SB-22-36, SB-24-03, SB-24-36, SB-25-03, SB-25-36, SB-26-03, SB-27-03, SB-27-35.5, SB-28-03, SB-28-36, SB-29-03, SB-29-36, SB-29-36D, SB-30-03, SB-30-36, SB-31-03, SB-31-38, SB-32-03, SB-32-37
- Beryllium:	SB-7-03, SB-20-35.5
- Lead:	SB-1A-2.5, SB-4-13, SB-14-03, SB-15-03, SB-15-36, SB-20-03, SB-23-03, SB-25-36, SB-26-03, SB-29-03, SB-30-03, and SB-32-03

- The TACO Tier 1 soil ingestion exposure route remediation objectives for the construction worker scenario for lead (SB-1A-2.5, SB-4-13, SB-14-03, SB-15-03, SB-15-36, SB-20-03, SB-23-03, SB-25-36, SB-26-03, SB-29-03, SB-30-03, and SB-32-03) and Aroclor 1260 (SB-26-03) were exceeded.

- No existing TACO Tier 1 soil inhalation exposure route remediation objectives for the industrial-commercial or construction worker scenario were exceeded. No such remediation objectives have been established for some of the chemicals detected in soil samples collected in Study Area No. 13.

- Arsenic concentrations exceeding the TACO Tier 1 soil ingestion exposure route remediation objective of 3 mg/kg were detected in 50 of 51 soil samples. However, only 6 of the samples had arsenic concentrations exceeding the IEPA background concentration for metropolitan areas of 13 mg/kg.

- The TACO Tier 1, Class I groundwater remediation objectives for naphthalene (TMW-3), lead (TMW-1 through TMW-3), and nickel (TMW-1 and TMW-2) were exceeded. However, the groundwater samples were unfiltered, and the laboratory analytical results may have been skewed high by elevated concentrations of solids.

- The TACO Tier 1, Class II groundwater remediation objectives for lead (TMW-2) and nickel (TMW-1 and TMW-2) were exceeded. However, the groundwater samples were unfiltered, and the laboratory analytical results may have been skewed high by elevated concentrations of solids.

- The TACO Tier 1 remediation objective for GRO/DRO was exceeded in SB-32-37.

Based on the findings summarized above, Tetra Tech offers the following recommendations:

- TACO Tier 1 remediation objectives for the soil ingestion exposure route for SVOCs were slightly exceeded in soil samples SB-15-03, SB-17-36, and SB-27-03. Soil sample analytical result averaging or a TACO Tier 3 assessment should be performed to address the SVOCs detected at the site.

- TACO Tier 1 remediation objectives for the soil ingestion exposure route for SVOCs were exceeded in soil sample SB-15-36. The extent of the SVOC impact around soil boring SB-15 should be delineated. Soil excavation, soil sample analytical result averaging, or a TACO Tier 3 assessment should be performed to address the SVOCs detected at soil boring SB-15.

- The TACO Tier 1 remediation objectives for the soil ingestion exposure route for Aroclor 1260 was exceeded in soil sample SB-26-03. No historical use of PCBs has been identified for Study Area No. 13, and this chemical is not widely distributed at the site. The extent of the Aroclor 1260 impact around soil boring SB-26 should be delineated. Soil excavation should be performed to address the Aroclor 1260 detected at soil boring SB-26.

- Arsenic was widely detected in surface and subsurface soils at concentrations exceeding the TACO Tier 1 remediation objective of 3 mg/kg. However, the arsenic concentrations in only six soil samples exceeded the IEPA background concentration for metropolitan areas of 13 mg/kg. Soil sample analytical result averaging or a TACO Tier 3 assessment should be performed to address the arsenic detected at the site.

- Total lead was detected in surface and subsurface soils at concentrations exceeding the TACO Tier 1 remediation objective for the ingestion exposure route for the industrial-commercial and construction worker scenarios in soil borings SB-1A, SB-4, SB-14, SB-15, SB-20, SB-23, SB-25, SB-26, SB-29, SB-30, and SB-32. Soil in the vicinity of SB-1A was excavated in January 2001 as part of a remedial action; thus, lead contamination at SB-1A is no longer of concern. The extent of the lead impact around

soil borings SB-4, SB-14, SB-15, SB-20, SB-23, SB-25, SB-26, SB-29, SB-30, and SB-32 should be delineated. Soil excavation, soil sample analytical result averaging, or a TACO Tier 3 assessment should be performed to address the lead detected at the site.

- TCLP lead was detected in surface soil at concentrations exceeding the TACO Tier 1 remediation objective for the soil component of the groundwater migration route for Class I and II groundwater in soil borings SB-15, SB-26, and SB-30. The TCLP lead extract concentrations ranged from 14.8 to 128 mg/L and exceeded the EPA hazardous waste criterion of 5 mg/L; therefore, soil at the site is characteristically hazardous for lead toxicity. The extent of the TCLP lead impact at soil borings SB-15, SB-26, and SB-30 should be delineated. Soil excavation should be performed to address the TCLP lead detected at the site.

- The TACO Tier 1 remediation objective for soil attenuation capacity for soils one meter below ground surface was exceeded in soil sample SB-32-37. Soil excavation should be performed to address the GRO/DRO detected at soil boring SB-32.

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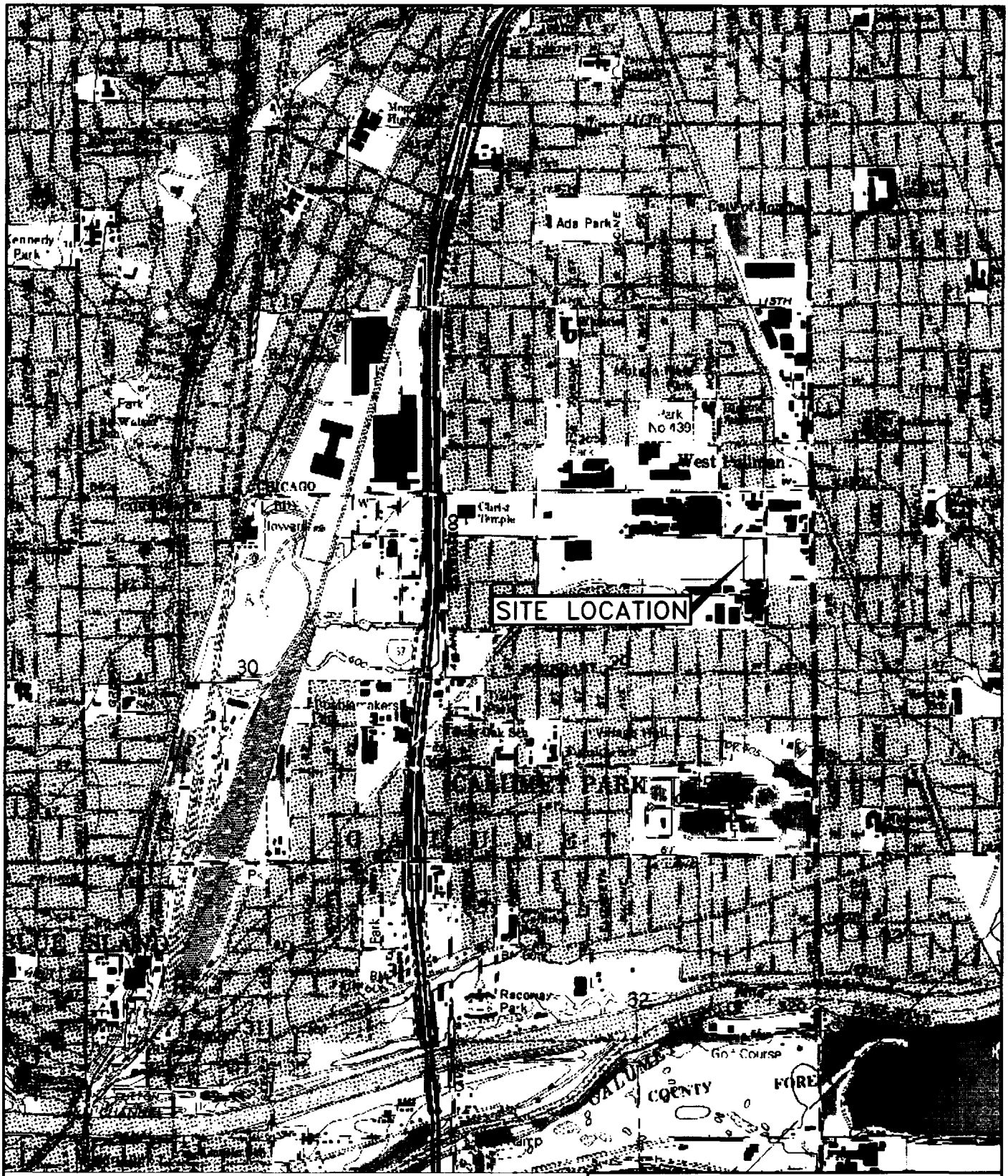
APPENDIX A

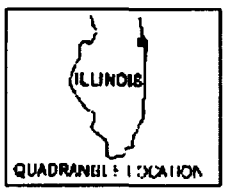
FIGURES

- A-1 SITE LOCATION MAP
- A-2 SITE FEATURES AND AREAS OF ENVIRONMENTAL CONCERN
- A-3 SAMPLING LOCATIONS
- A-4A GEOLOGIC CROSS SECTION A - A'
- A-4B GEOLOGIC CROSS SECTION B - B'
- A-5 POTENTIOMETRIC SURFACE MAP
- A-6 ARSENIC SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
- A-7 LEAD SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
- A-8 TCLP LEAD SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
- A-9 OTHER METAL SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
- A-10 SVOC SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
- A-11 VOC SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
- A-12 PCB AND HERBICIDE SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
- A-13 GROUNDWATER SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES



0 1000 2000

SCALE IN FEET

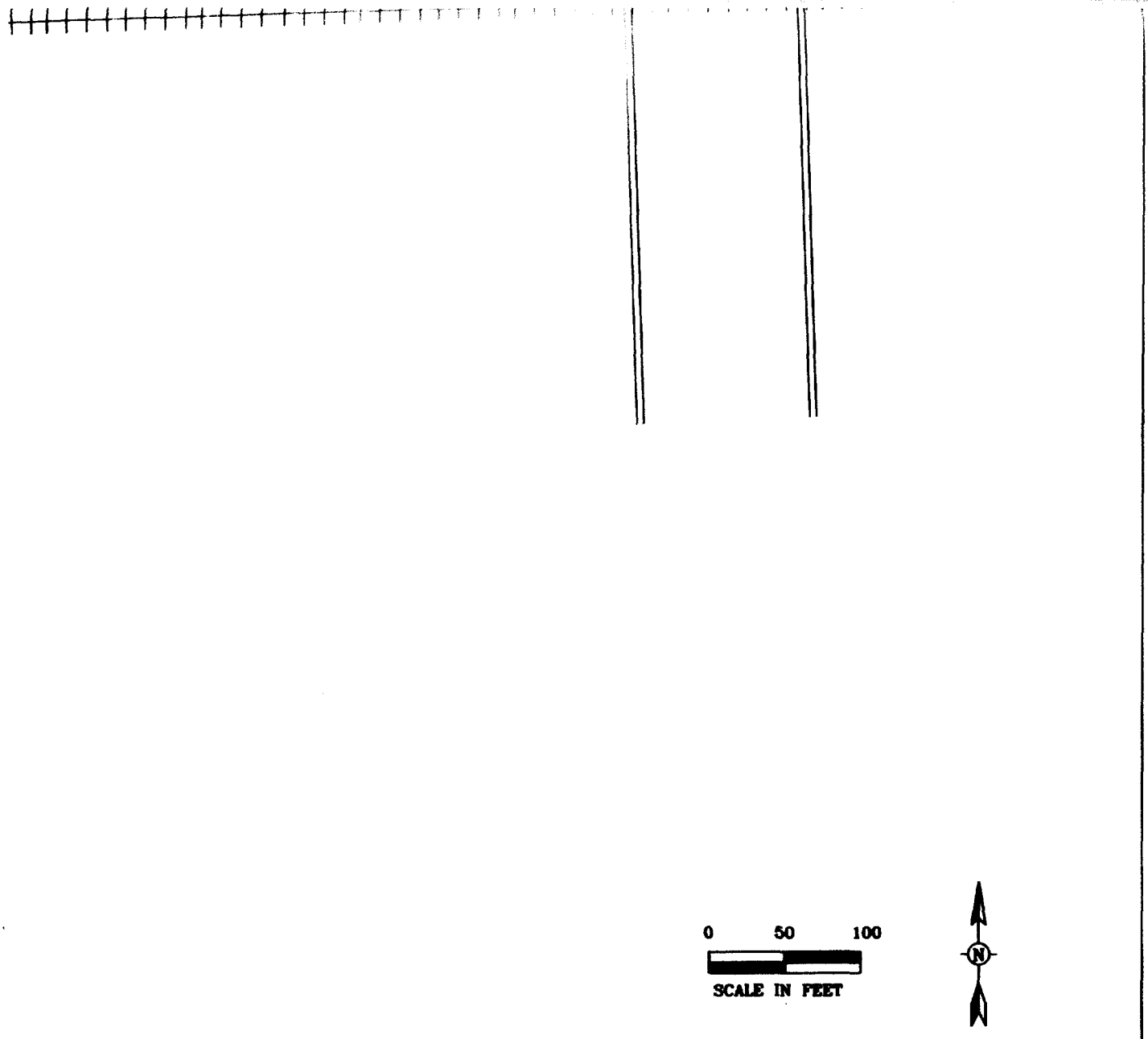


SOURCE: MODIFIED FROM USGS, 7.5-MINUTE TOPOGRAPHIC MAP OF BLUE ISLAND, ILLINOIS, QUADRANGLE, 1993

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-1
SITE LOCATION MAP
STUDY AREA NO. 13

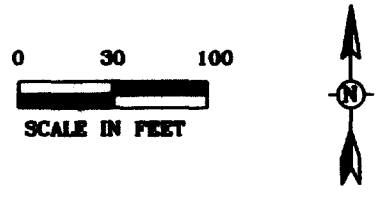
Tetra Tech EM Inc.



CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-2
SITE FEATURES AND AREAS OF ENVIRONMENTAL CONCERN STUDY AREA NO. 13

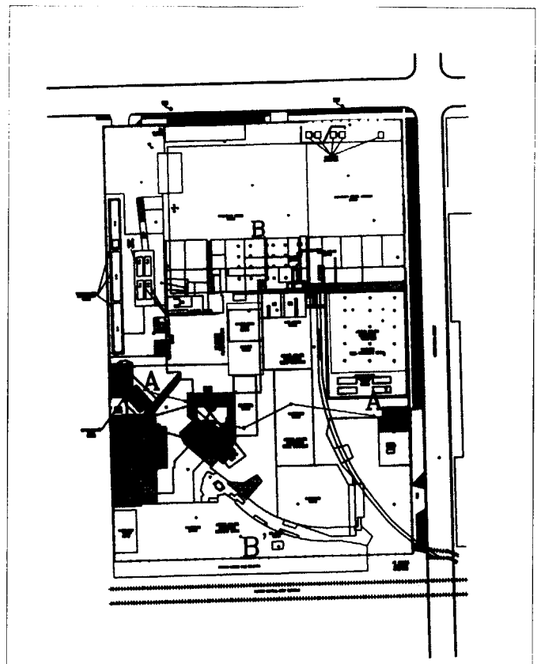
Tetra Tech EM Inc.

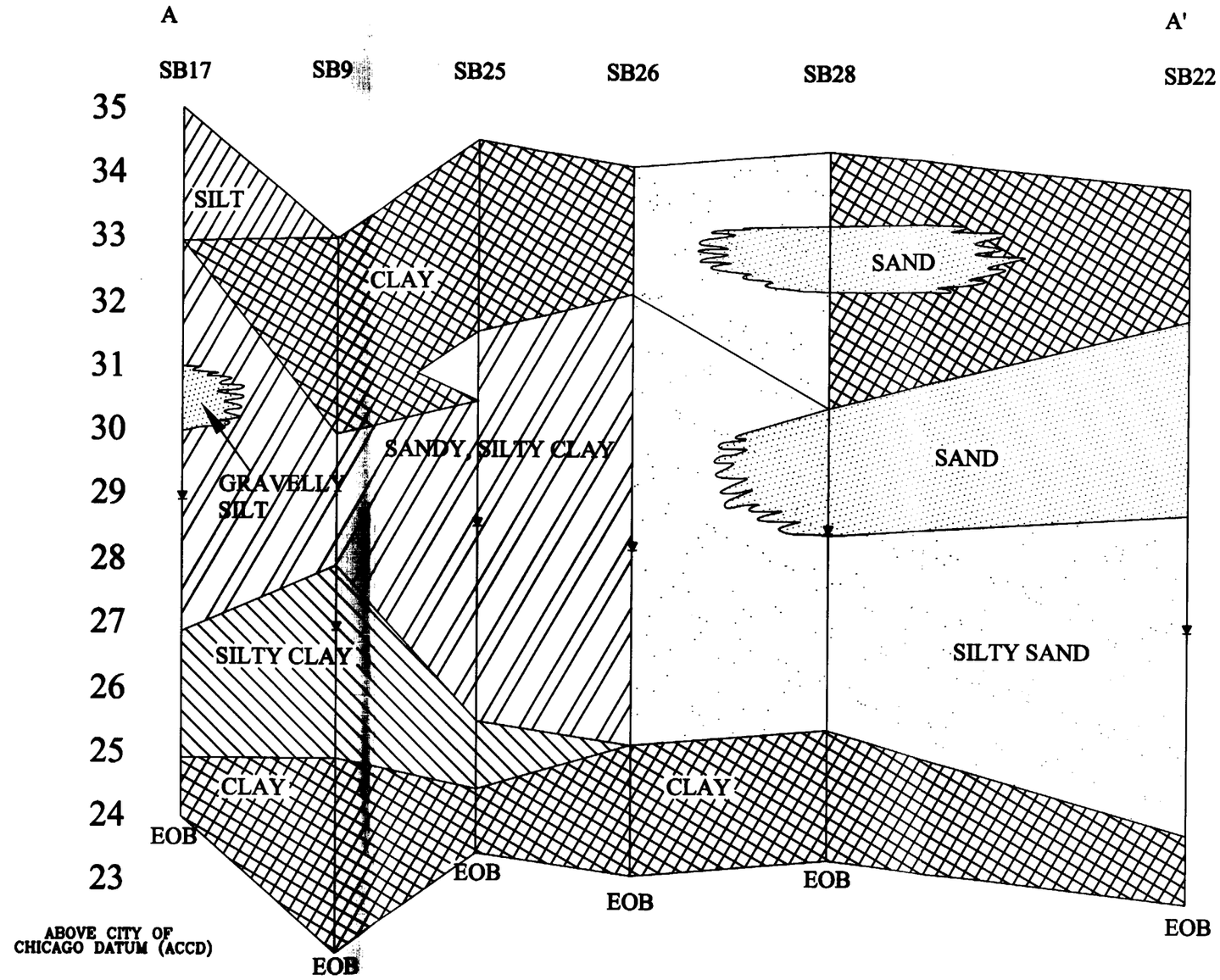


CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-3
SAMPLING LOCATIONS
STUDY AREA NO. 13

Tetra Tech EM Inc.





HORIZONTAL SCALE: 1" = 40 FEET
VERTICAL SCALE: 1" = 2 FEET

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-4a
GEOLOGIC CROSS SECTION A-A'
STUDY AREA NO. 13

Tetra Tech EM Inc.

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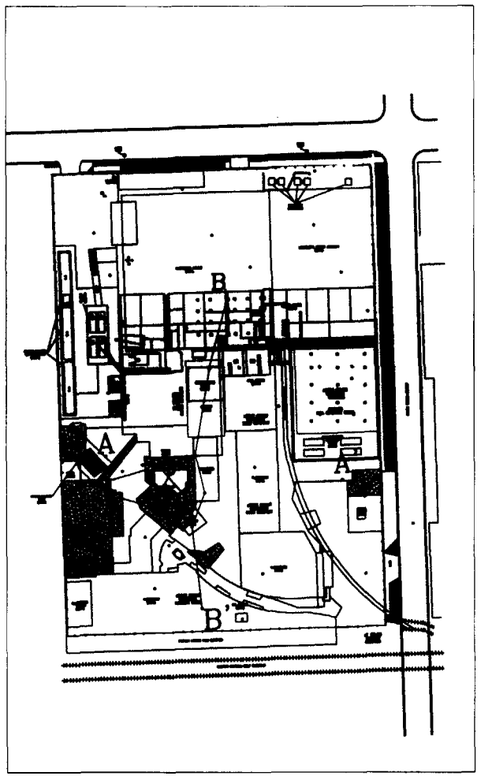

B

B'

SB11 SB14 SB20 SB26 SB27 SB31

35 34 33 32 31 30 29 28 27 26 25 24 23

CLAY
FILL
SAND
SILTY SAND
SILTY CLAY
EOB
EOB
FILL
SILTY CLAY
SAND
SILTY SAND
CLAY
EOB
EOB
EOB

ABOVE CITY OF CHICAGO DATUM (ACCD)

HORIZONTAL SCALE: 1" = 40 FEET
VERTICAL SCALE: 1" = 2 FEET

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-4b
GEOLOGIC CROSS SECTION B-B'
STUDY AREA NO. 13

Tetra Tech EM Inc.

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N

W E

S

LEGEND

MONITORING WELL LOCATION

SITE FEATURES FROM 1939 SANBORN MAP

SITE FEATURES FROM 1911 SANBORN MAP

SITE FEATURES FROM 1975 SANBORN MAP

SITE FEATURES FROM 1950 SANBORN MAP

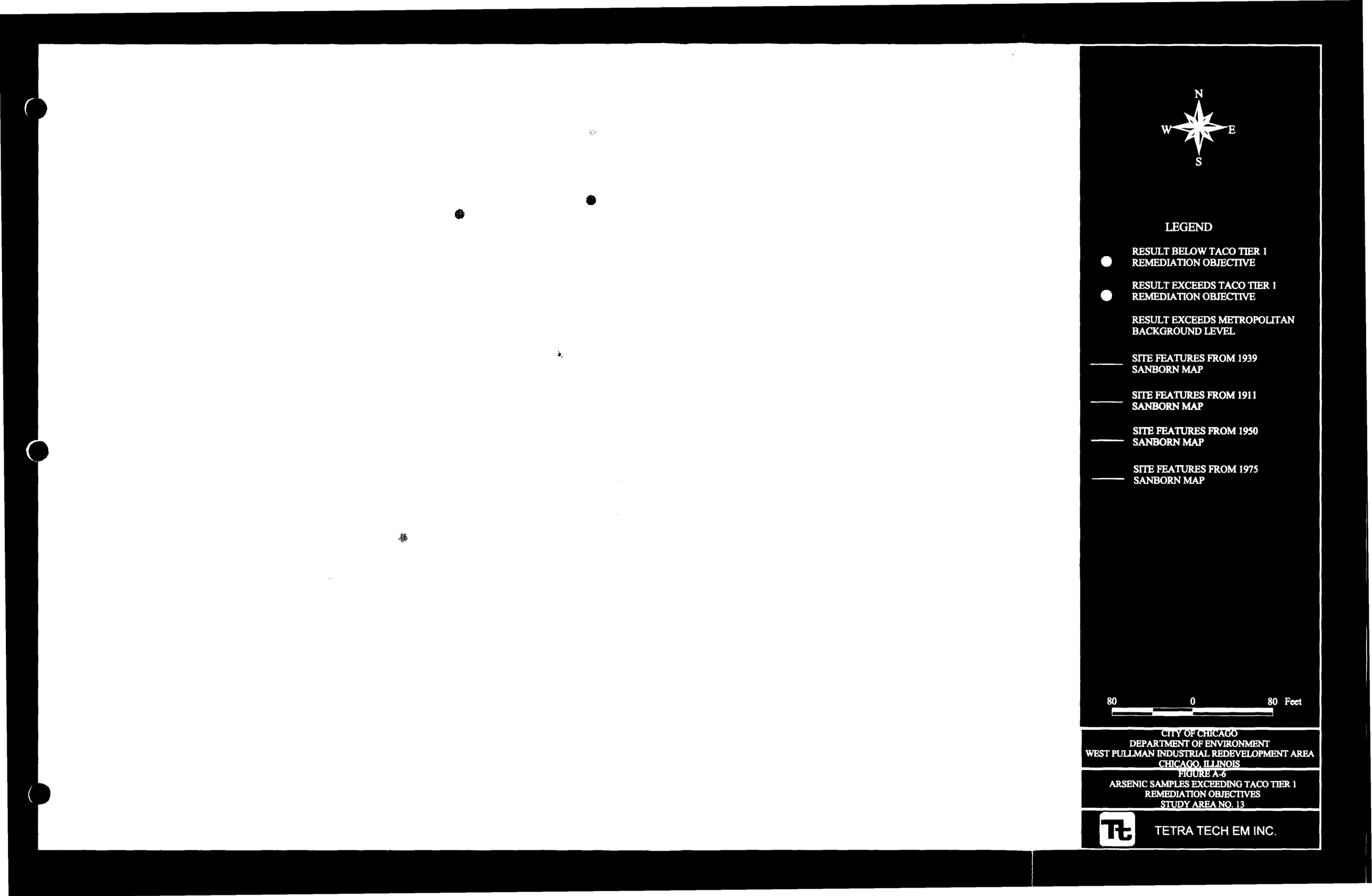
WELL	ELEVATION (ft)
TMW-1	24.799
TMW-2	30.699
TMW-3	29.469

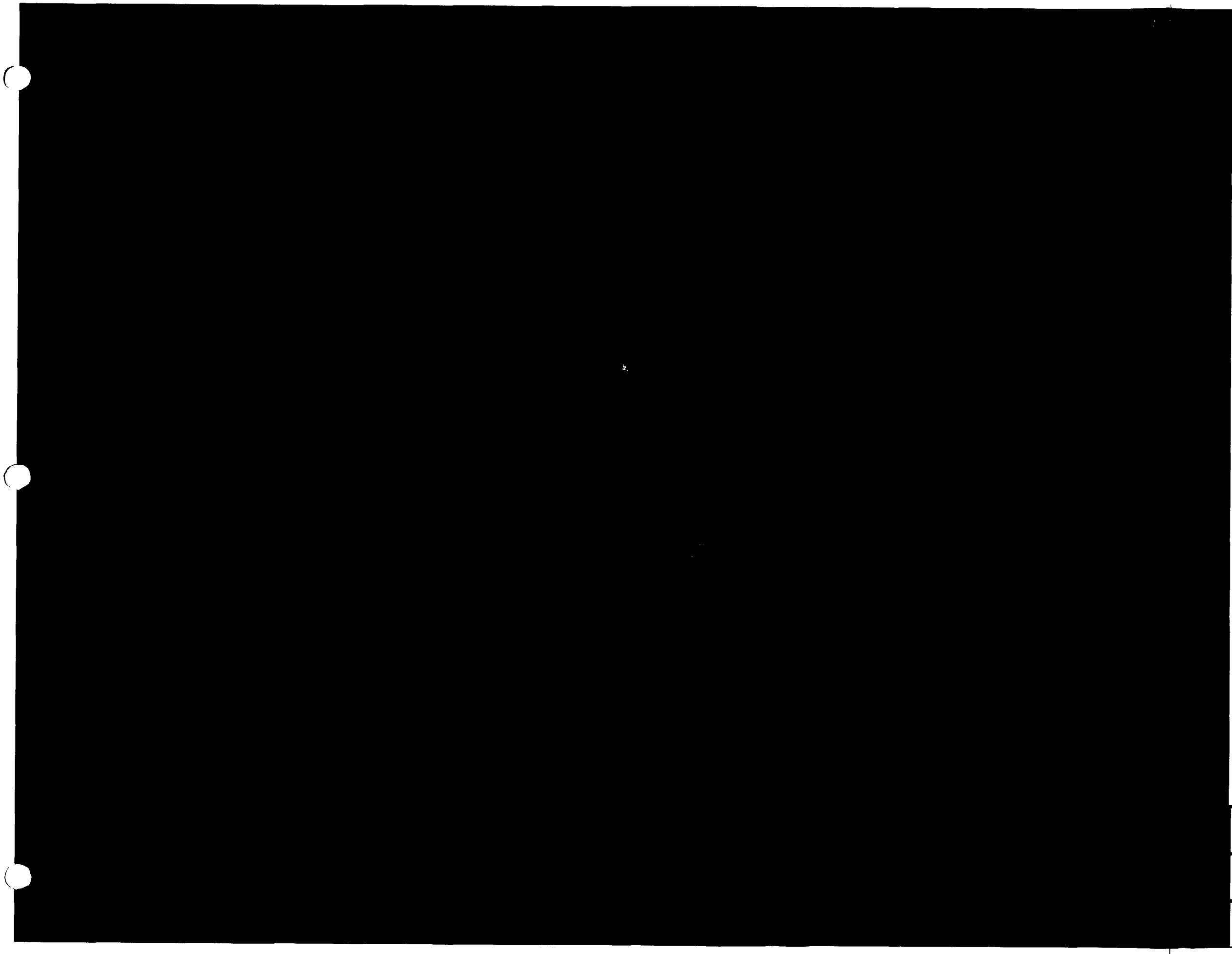
80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-5
POTENTIOMETRIC SURFACE MAP
STUDY AREA NO. 13

TETRA TECH EM INC.


N
W
E
S
LEGEND
RESULT BELOW TACO TIER 1 REMEDIATION OBJECTIVE
RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE
RESULT EXCEEDS METROPOLITAN BACKGROUND LEVEL
SITE FEATURES FROM 1939 SANBORN MAP
SITE FEATURES FROM 1911 SANBORN MAP
SITE FEATURES FROM 1950 SANBORN MAP
SITE FEATURES FROM 1975 SANBORN MAP
80
0
80 Feet
CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS
FIGURE A-6
ARSENIC SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
STUDY AREA NO. 13
TETRA TECH EM INC.



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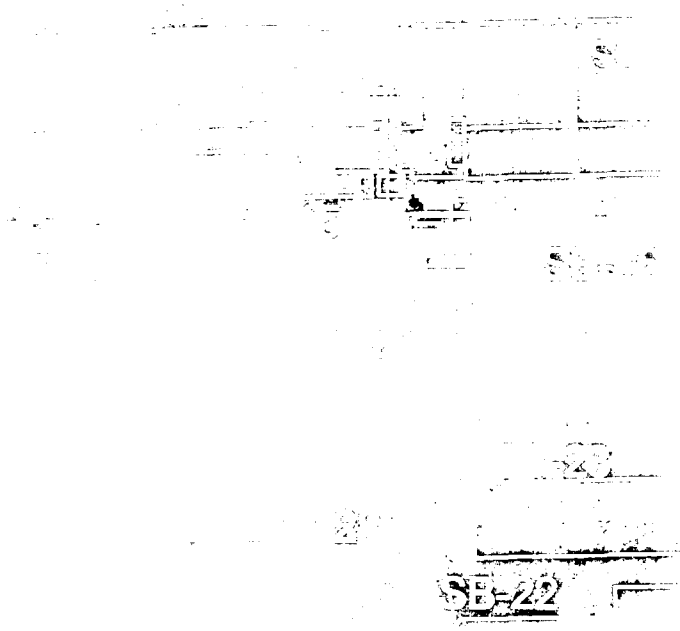
LEGEND

- RESULT BELOW TACO TIER 1 REMEDIATION OBJECTIVE
- RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE
- SITE FEATURES FROM 1939 SANBORN MAP
- SITE FEATURES FROM 1911 SANBORN MAP
- SITE FEATURES FROM 1950 SANBORN MAP
- SITE FEATURES FROM 1975 SANBORN MAP

80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS
FIGURE A-7
LEAD SAMPLES EXCEEDING TACO TIER 1
REMEDIATION OBJECTIVES
STUDY AREA NO. 13

TETRA TECH EM INC.



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LEGEND

RESULT BELOW TACO TIER 1 REMEDIATION OBJECTIVE

RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE

SITE FEATURES FROM 1939 SANBORN MAP

SITE FEATURES FROM 1911 SANBORN MAP

SITE FEATURES FROM 1950 SANBORN MAP

SITE FEATURES FROM 1975 SANBORN MAP

80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-8
TCLP LEAD SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
STUDY AREA NO. 13

TETRA TECH EM INC.

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LEGEND

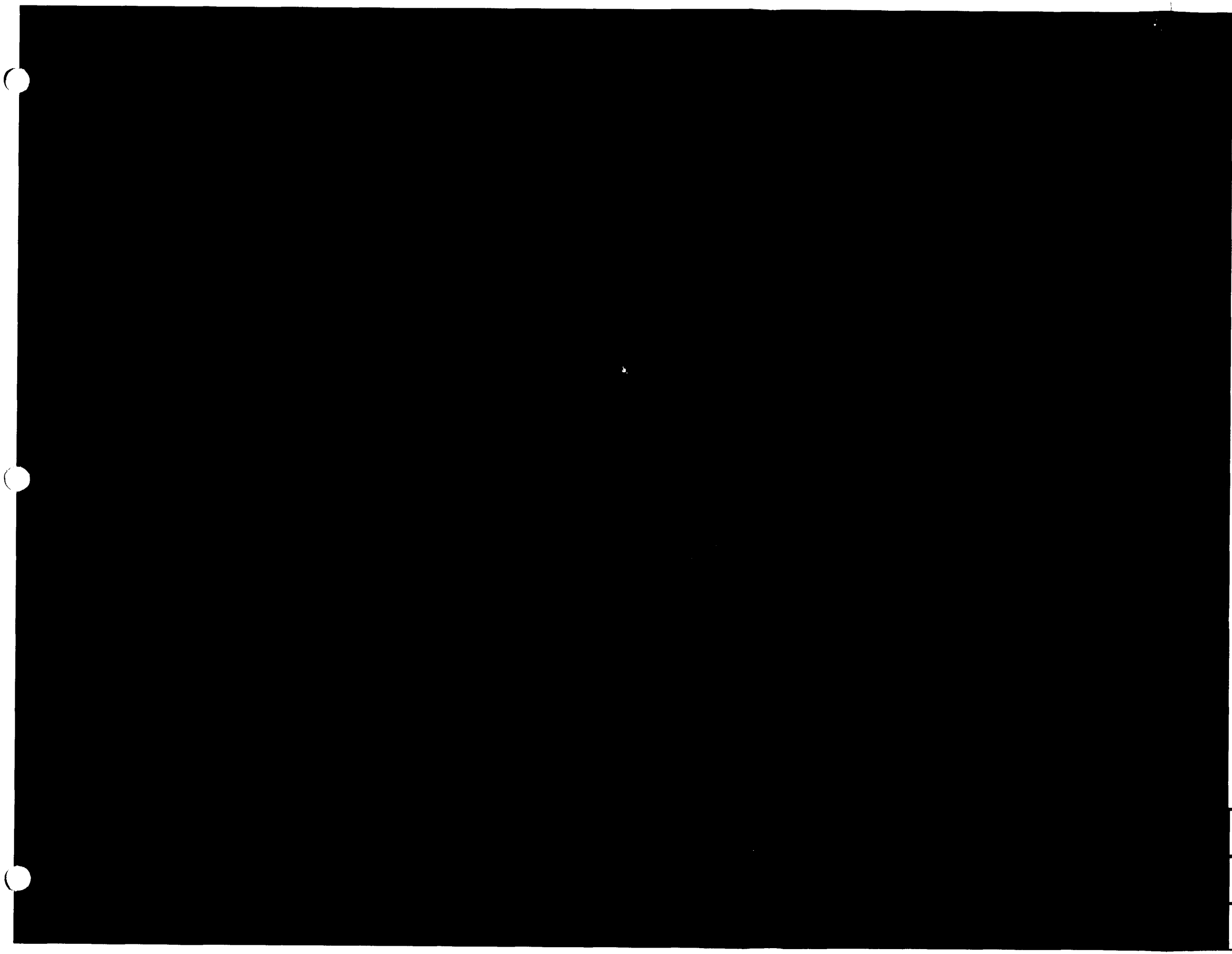
- RESULT BELOW TACO TIER 1 REMEDIATION OBJECTIVE
- RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE
- ANTIMONY AND SELENIUM EXCEED TACO TIER 1 REMEDIATION OBJECTIVE
- SITE FEATURES FROM 1939 SANBORN MAP
- SITE FEATURES FROM 1911 SANBORN MAP
- SITE FEATURES FROM 1950 SANBORN MAP
- SITE FEATURES FROM 1975 SANBORN MAP

80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-9
OTHER METAL SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
STUDY AREA NO. 13

TETRA TECH EM INC.



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LEGEND

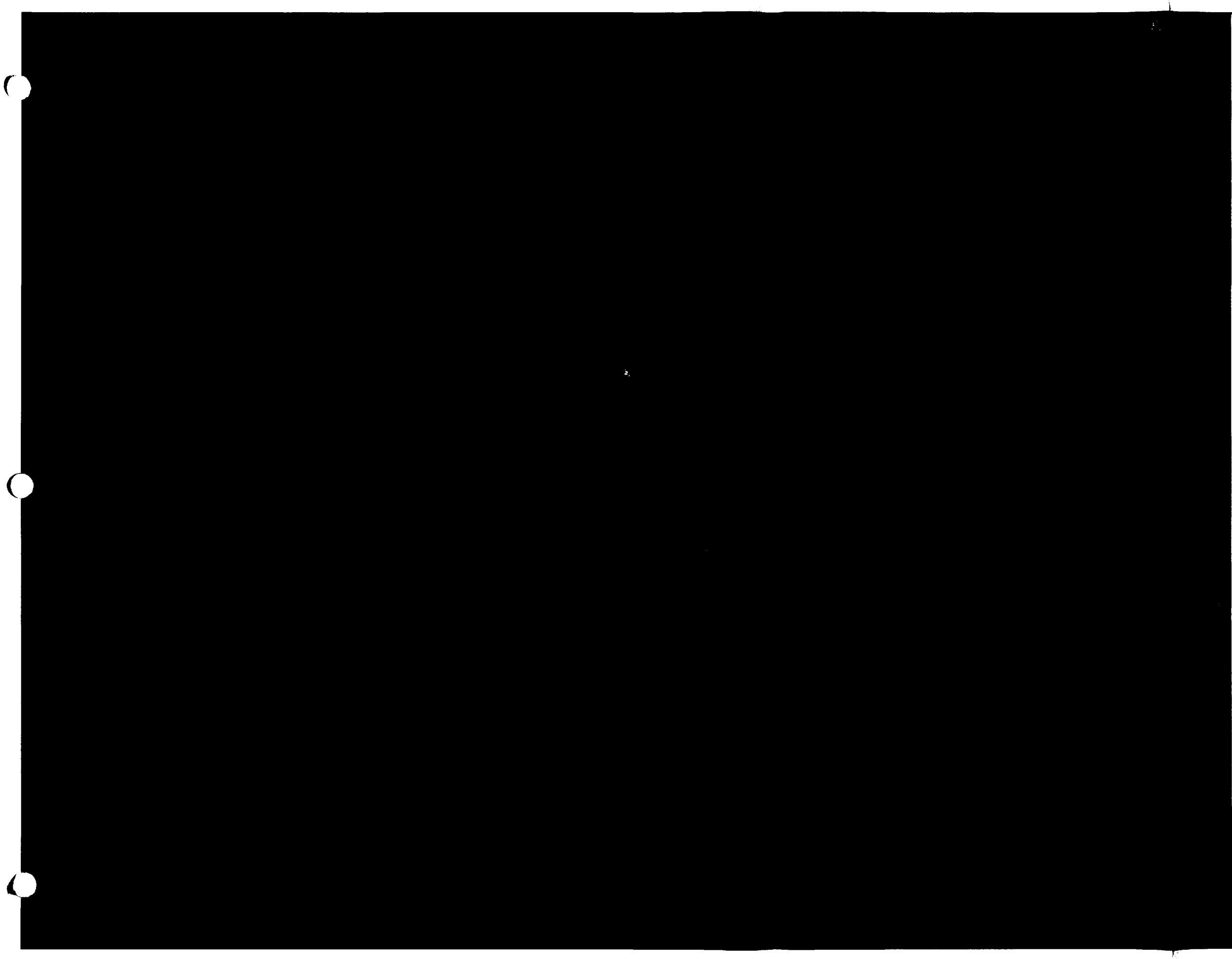
- RESULT BELOW TACO TIER 1 REMEDIATION OBJECTIVE
- RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE
- SITE FEATURES FROM 1939 SANBORN MAP
- SITE FEATURES FROM 1911 SANBORN MAP
- SITE FEATURES FROM 1950 SANBORN MAP
- SITE FEATURES FROM 1975 SANBORN MAP

80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-10
SVOC SAMPLES EXCEEDING TACO TIER 1
REMEDIATION OBJECTIVES
STUDY AREA NO. 13

TETRA TECH EM INC.



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LEGEND

- RESULT BELOW TACO TIER 1 REMEDIATION OBJECTIVE
- RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE
- SITE FEATURES FROM 1939 SANBORN MAP
- SITE FEATURES FROM 1911 SANBORN MAP
- SITE FEATURES FROM 1950 SANBORN MAP
- SITE FEATURES FROM 1975 SANBORN MAP

80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-11
VOC SAMPLES EXCEEDING TACO TIER 1
REMEDIATION OBJECTIVES
STUDY AREA NO. 13

TETRA TECH EM INC.

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LEGEND

RESULT BELOW TACO TIER 1 REMEDIATION OBJECTIVE

RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE

SITE FEATURES FROM 1939 SANBORN MAP

SITE FEATURES FROM 1911 SANBORN MAP

SITE FEATURES FROM 1950 SANBORN MAP

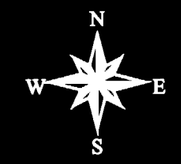
SITE FEATURES FROM 1975 SANBORN MAP

80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-12
PCB AND HERBICIDE SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
STUDY AREA NO. 13

TETRA TECH EM INC.



LEGEND

- RESULT EXCEEDS TACO TIER 1 REMEDIATION OBJECTIVE
- SITE FEATURES FROM 1939 SANBORN MAP
- SITE FEATURES FROM 1911 SANBORN MAP
- SITE FEATURES FROM 1950 SANBORN MAP
- SITE FEATURES FROM 1975 SANBORN MAP

80 0 80 Feet

CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
CHICAGO, ILLINOIS

FIGURE A-13
GROUNDWATER SAMPLES EXCEEDING
TACO TIER 1 REMEDIATION OBJECTIVES
STUDY AREA NO. 13

TETRA TECH EM INC.

APPENDIX B

TABLES

Key to Tables for Study Area No. 13: Exceedances of Tiered Approach to Corrective Action Objectives (TACO) Tier 1 Remediation Objectives

■ = Exceedance of Class I Groundwater Remediation Objective

■ = Exceedance of Class II Groundwater Remediation Objective

□ = Exceedance of Industrial-Commercial Soil Ingestion Remediation Objective

■ = Exceedance of Industrial-Commercial and Construction Worker Soil Ingestion Remediation Objective

■ = Exceedance of Industrial-Commercial Soil Inhalation and Construction Worker Soil Ingestion Remediation Objective

■ = Exceedance of Industrial-Commercial Soil Ingestion and Class I Groundwater Remediation Objective

■ = Exceedance of Industrial-Commercial Soil Ingestion and Class II Groundwater Remediation Objective

□ = Exceedence of the default Soil Attenuation Capacity greater than one meter below Ground surface

TABLE B-1
NUMBERS AND TYPES OF INVESTIGATIVE AND QC SAMPLES COLLECTED
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, IL

Analytical Parameter	Matrix	No. of Investigative Samples	No. of Duplicate Samples	No. of MS/MSDs	No. of Equipment Blank Samples	No. of Trip Blank Samples	No. of Total Samples Analyzed	Analytical Method[a]
VOCs	Soil	54	4	0/0	1	0	59	8260B (5035)
	Water	3	0	0/0	1	3	7	8260B
SVOCs	Soil	51	4	0/0	1	0	56	8270C
	Water	3	0	0/0	1	0	4	8270C
TCLP Lead	Soil	3	0	0/0	0	0	4	1312
	Water	0	0	0/0	0	0	0	7421
TPP Metals	Soil	51	4	0/0	1	0	56	Varies
	Water	3	0	0/0	1	0	4	Varies
pH	Soil	51	4	0/0	1	0	56	9045C
PCBs	Soil	13	1	0/0	1	0	15	8082
	Water	0	0	0/0	0	0	0	8082
Herbicides	Soil	3	1	0/0	1	0	5	8151A
	Water	0	0	0/0	0	0	0	8151A
GRO/DRO	Soil	4	0	0/0	0	0	4	8015B(M)
	Water	0	0	0/0	0	0	0	8015B(M)

Notes:

DRO = Diesel range organics
GRO = Gasoline range organics
MS/MSD = Matrix spike/matrix spike duplicate
PCB = Polychlorinated biphenyl
QC = Quality control
SVOC = Semivolatile organic compound
TCLP = Toxicity Characteristic Leaching Procedure
TPP = Total Priority Pollutant
VOC = Volatile organic compound

a The analytical method indicated is from the U.S. Environmental Protection Agency's Test Methods for Evaluating Solid Waste" (SW-846) dated December 1996.

TABLE B-2
GROUNDWATER SAMPLING AND ANALYSIS APPROACH
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, IL

Temporary Monitoring Well No.	Number of Samples	Analytical Parameters
TMW-1	1	VOCs, SVOCs, and TPP metals
TMW-2	1	VOCs, SVOCs, and TPP metals
TMW-3	1	VOCs, SVOCs, and TPP metals

Notes:

SVOC = Semivolatile organic compound
TPP = Total Priority Pollutant
VOC = Volatile organic compound

TABLE B-3
GROUNDWATER ELEVATIONS ON MAY 24, 2001
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, IL

Temporary Monitoring Well No.	TOC Elevation (feet accd)	Depth to Water (feet below TOC)	Groundwater Elevation (feet accd)
TMW-1	33.299	8.5	24.799
TMW-2	34.869	4.2	30.669
TMW-3	34.669	5.2	29.469

Notes:

accd = Above Chicago City datum
TOC = Top of casing

TABLE B-4a
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-1-1 07/13/99	SB-1-6 07/13/99	SB-2-2 07/13/99	SB-2-6 07/13/99	SB-3-2 07/13/99	SB-3-6 07/13/99	SB-4-2 07/13/99	SB-4-6 07/13/99	SB-5-2 07/13/99		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	190/190	1,000,000	410	410,000	410

TABLE B-4a (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-5-6 007/13/99	SB-6-03 05/21/01	SB-6-35 05/21/01	SB-7-03 05/22/01	SB-7-39 05/22/01	SB-7-39D 05/22/01	SB-8-03 05/21/01	SB-8-37 05/21/01	SB-9-03 05/21/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	ND	0.062 U	0.015 U	0.016	0.008	ND	0.037 U	0.033 U	0.019 U	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	ND	ND	ND	ND	ND	ND	0.011	0.025	ND	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	0.21	ND	ND	ND	ND	ND	ND	ND	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	0.11	ND	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	0.004 J	ND	ND	ND	ND	ND	ND	0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	0.28	ND	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	0.006	ND	ND	ND	ND	ND	ND	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	0.23	ND	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	190/190	1,000,000	410	410,000	410

TABLE B-4a (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-9-03D 05/21/01	SB-9-37 05/21/01	SB-11-03 05/22/01	SB-11-36 05/22/01	SB-12-03 05/21/01	SB-12-49 05/21/01	SB-14-03 05/22/01	SB-14-36 05/22/01	SB-15-03 05/22/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	0.031 U	0.42	0.1	ND	NA	NA	ND	ND	ND	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	ND	0.033 J	ND	ND	NA	NA	ND	ND	ND	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	0.026	ND	NA	NA	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	ND	[redacted]	ND	ND	NA	NA	ND	ND	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	ND	ND	NA	NA	ND	ND	ND	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	ND	NA	NA	ND	ND	ND	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	ND	ND	ND	ND	NA	NA	ND	ND	ND	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	ND	NA	NA	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	ND	ND	NA	NA	ND	ND	ND	0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	ND	NA	NA	ND	ND	ND	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	0.046	ND	NA	NA	ND	ND	ND	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	ND	NA	NA	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	ND	ND	NA	NA	0.052 J	ND	ND	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	ND	ND	NA	NA	ND	ND	ND	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	ND	NA	NA	ND	ND	ND	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	ND	NA	NA	0.013 J	ND	ND	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	ND	NA	NA	ND	ND	ND	190/190	1,000,000	410	410,000	410

TABLE B-4a (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-15-35 05/22/01	SB-16-03 05/22/01	SB-16-37 05/22/01	SB-17-03 05/21/01	SB-17-36 05/21/01	SB-19-03 05/21/01	SB-19-36 05/21/01	SB-19-45 05/21/01	SB-20-03 05/21/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	0.084	0.022	0.013	ND	ND	NA	NA	ND	0.018 U	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	ND	ND	ND	ND	ND	NA	NA	ND	ND	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	ND	ND	ND	NA	NA	ND	ND	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	ND	ND	ND	ND	ND	NA	NA	ND	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	ND	ND	ND	NA	NA	ND	ND	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	ND	ND	NA	NA	0.21	ND	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	0.007	ND	ND	ND	ND	NA	NA	ND	ND	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	ND	0.11	NA	NA	0.45	ND	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	ND	ND	ND	NA	NA	[redacted]	ND	0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	ND	0.28	NA	NA	1.2	ND	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	ND	ND	ND	NA	NA	ND	ND	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	ND	ND	NA	NA	0.36	ND	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	NA	NA	0.31	ND	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	NA	NA	0.61	ND	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	ND	ND	NA	NA	0.21	ND	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	ND	0.23	NA	NA	0.62	ND	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	ND	ND	NA	NA	0.088	ND	190/190	1,000,000	410	410,000	410

TABLE B-4a (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-20-35.5 05/21/01	SB-21-03 05/22/01	SB-21-38 05/22/01	SB-21-38D 05/22/01	SB-22-03 05/22/01	SB-22-36 05/22/01	SB-23-03 05/22/01	SB-23-37.5 05/22/01	SB-24-03 05/22/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	0.053 U	ND	0.013	0.051	ND	0.014	NA	NA	0.006	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	0.024	ND	ND	ND	ND	ND	NA	NA	0.024	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	ND	0.011	ND	ND	NA	NA	ND	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	NA	NA	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	ND	ND	ND	ND	NA	NA	ND	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	ND	ND	ND	NA	NA	ND	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	ND	ND	ND	ND	ND	ND	NA	NA	ND	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	ND	ND	ND	ND	NA	NA	ND	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	NA	NA	ND	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	ND	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	ND	ND	ND	NA	NA	ND	190/190	1,000,000	410	410,000	410

TABLE B-4a (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-24-36 05/21/01	SB-25-03 05/21/01	SB-25-36 05/21/01	SB-26-03 05/21/01	SB-26-36 05/21/01	SB-27-03 05/21/01	SB-27-35.5 05/21/01	SB-28-03 05/22/01	SB-28-36 05/22/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	ND	ND	ND	0.008 U	ND	ND	ND	ND	0.053 U	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	0.012	ND	ND	ND	0.032	ND	0.011	ND	ND	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	0.067 J	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	0.046 J	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	190/190	1,000,000	410	410,000	410

TABLE B-4a (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-29-03 05/23/01	SB-29-36 05/23/01	SB-29-36D 05/23/01	SB-30-03 05/23/01	SB-30-36 05/23/01	SB-31-03 05/23/01	SB-31-38 05/23/01	SB-32-03 05/23/01	SB-32-37 05/23/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	0.046 U	0.24 U	0.038 U	0.1 U	0.21 U	0.028 U	0.06 U	ND	ND	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	0.016 J	ND	ND	0.012 J	ND	0.054	0.039	0.28	0.045	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	ND	ND	ND	ND	ND	1.2	0.17	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	ND	ND	ND	ND	0.42	0.54	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	0.032	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	0.082	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	ND	0.02 J	ND	ND	ND			0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	0.14	0.2	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	ND	0.011 J	ND	ND	ND		0.17	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	0.47	0.39	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	0.2	0.17	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	0.17	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	0.18	0.18	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	0.011	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	0.17	190/190	1,000,000	410	410,000	410

TABLE B-4a (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - VOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected		QC Sample	Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
					Industrial-Commercial		Construction Worker	
	HB-7-2 05/23/01	SEQB-1 05/23/01	Trip Blank		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acetone	0.04	ND	ND	16/16	200,000	100,000	200,000	100,000
Carbon disulfide	ND	ND	ND	32/160	200,000	720	20,000	9.0
2-Butanone	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2-Dichloropropane	ND	ND	ND	0.03/0.15	84	23	1,800	0.5
Methylene chloride	ND	ND	0.005 J	0.02/0.2	760	24	12,000	34
m and p-Xylenes	ND	ND	ND	210/200	1,000,000	420/460	410,000	420/460
Naphthalene	ND	ND	ND	84/420	82,000	NE	8,200	NE
Isopropylbenzene	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzene	ND	ND	ND	0.03/0.17	200	1.5	4,300	2.1
n-Propylbenzene	ND	ND	ND	NE/NE	NE	NE	NE	NE
Toluene	ND	ND	ND	12/29	410,000	650	410,000	42
p-Isopropyltoluene	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,2,4-Trimethylbenzene	ND	ND	ND	NE/NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	ND	ND	ND	NE/NE	NE	NE	NE	NE
Ethylbenzene	ND	ND	ND	13/19	200,000	400	20,000	58
sec-Butylbenzene	ND	ND	ND	NE/NE	NE	NE	NE	NE
o-Xylene	ND	ND	ND	190/190	1,000,000	410	410,000	410

Notes:
J = Estimated value
NA = Not analyzed for
ND = Not detected
NE = Not established
QC = Quality control
U = Below detection limit
VOC = Volatile organic compound

All values are expressed in milligrams per kilogram.

TABLE B-4b
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-1-02 07/13/99	SB-1A-2 07/13/99	SB-1A-2.5 07/13/99	SB-1-57 07/13/99	SB-1A-3 07/13/99	SB-1A-3.5 07/13/99	SB-1A-4 07/13/99	SB-2-13 07/13/99	SB-2-57 07/13/99		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	ND	NA	NA	ND	NA	NA	NA	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	ND	NA	NA	ND	NA	NA	NA	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	ND	NA	NA	ND	NA	NA	NA	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	ND	NA	NA	ND	NA	NA	NA	ND	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	ND	NA	NA	ND	NA	NA	NA	ND	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	ND	NA	NA	ND	NA	NA	NA	ND	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	ND	NA	NA	ND	NA	NA	NA	ND	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	ND	NA	NA	ND	NA	NA	NA	ND	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	ND	NA	NA	ND	NA	NA	NA	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	ND	NA	NA	ND	NA	NA	NA	ND	ND	930/930	410,000	930	410,000	930
Carbazole	ND	NA	NA	ND	NA	NA	NA	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	ND	NA	NA	ND	NA	NA	NA	ND	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	ND	NA	NA	ND	NA	NA	NA	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	ND	NA	NA	ND	NA	NA	NA	ND	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	ND	NA	NA	ND	NA	NA	NA	ND	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	ND	NA	NA	ND	NA	NA	NA	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	ND	NA	NA	ND	NA	NA	NA	ND	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	ND	NA	NA	ND	NA	NA	NA	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	ND	NA	NA	ND	NA	NA	NA	ND	ND	NE/NE	NE	NE	NE	NE
Naphthalene	ND	NA	NA	ND	NA	NA	NA	ND	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	ND	NA	NA	ND	NA	NA	NA	ND	ND	NE/NE	NE	NE	NE	NE
Phenol	ND	NA	NA	ND	NA	NA	NA	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	ND	NA	NA	ND	NA	NA	NA	ND	ND	4,200/21,000	61,000	NE	61,000	NE

TABLE B-4b (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-3-13 07/13/99	SB-3-57 07/13/99	SB-4-13 07/13/99	SB-4-57 07/13/99	SB-5-13 07/13/99	SB-5-57 07/13/99	SB-6-03 05/21/01	SB-6-35 05/21/01	SB-7-03 05/22/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	ND	ND	0.055	ND	ND	ND	ND	ND	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	ND	ND	0.06	ND	ND	ND	ND	ND	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	930/930	410,000	930	410,000	930
Carbazole	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	ND	ND	0.069	ND	ND	ND	ND	ND	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	ND	ND	0.16	ND	0.083	ND	ND	ND	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	ND	ND	0.077	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	ND	ND	0.13	ND	0.064	ND	ND	ND	ND	4,200/21,000	61,000	NE	61,000	NE

TABLE B-4b (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-7-39 05/22/01	SB-7-39D 05/22/01	SB-8-03 05/21/01	SB-8-37 05/21/01	SB-9-03 05/21/01	SB-9-03D 05/21/01	SB-9-37 05/21/01	SB-11-03 05/22/01	SB-11-36 05/22/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	ND	ND	ND	ND	ND	ND	0.170 J	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	ND	ND	ND	ND	ND	ND	0.340 J	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	0.48	ND	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	0.48	ND	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	0.49	ND	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	0.240 J	ND	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	0.48	ND	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	930/930	410,000	930	410,000	930
Carbazole	ND	ND	ND	ND	ND	ND	0.140 J	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	ND	ND	ND	ND	ND	ND	0.6	ND	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	ND	ND	ND	ND	ND	ND	0.088 J	ND	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	ND	ND	ND	ND	ND	ND	1.2	ND	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	ND	ND	ND	ND	ND	ND	0.160 J	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	0.290 J	ND	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	0.48	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Naphthalene	ND	ND	ND	ND	ND	ND	0.160 J	ND	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	ND	ND	ND	ND	ND	ND	1.1	0.160 J	ND	NE/NE	NE	NE	NE	NE
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	ND	ND	ND	ND	ND	ND	0.97	ND	ND	4,200/21,000	61,000	NE	61,000	NE

TABLE B-4b (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-12-03 05/21/01	SB-12-49 05/21/01	SB-14-03 05/22/01	SB-14-36 05/22/01	SB-15-03 05/22/01	SB-15-35 05/22/01	SB-16-03 05/22/01	SB-16-37 05/22/01	SB-17-03 05/21/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	NA	NA	ND	NA	0.140 J	3.0	ND	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	NA	NA	ND	NA	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	NA	NA	ND	NA	0.43	9.0	ND	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	NA	NA	0.110 J	NA	1.0	[redacted]	ND	ND	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	NA	NA	ND	NA	1.2	[redacted]	ND	ND	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	NA	NA	ND	NA	0.81	9.6	ND	ND	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	NA	NA	ND	NA	0.44	3.5 J	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	NA	NA	ND	NA	**1.0**	[redacted]	ND	ND	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	NA	NA	ND	NA	ND	ND	ND	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	NA	NA	ND	NA	ND	ND	ND	ND	ND	930/930	410,000	930	410,000	930
Carbazole	NA	NA	ND	NA	0.160 J	[redacted]	ND	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	NA	NA	0.170 J	NA	1.1	18 J	ND	ND	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	NA	NA	ND	NA	ND	**1.9**	ND	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	NA	NA	ND	NA	0.083 J	1.9	ND	ND	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	NA	NA	0.220 J	NA	1.9	35.0	ND	ND	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	NA	NA	ND	NA	0.130 J	3.1	ND	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	NA	NA	ND	NA	0.49	5 J	ND	ND	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	NA	NA	ND	NA	ND	1.1	ND	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	NA	NA	ND	NA	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Naphthalene	NA	NA	ND	NA	ND	1.8	ND	ND	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	NA	NA	0.140 J	NA	1.4	32.0	ND	ND	ND	NE/NE	NE	NE	NE	NE
Phenol	NA	NA	ND	NA	ND	ND	ND	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	NA	NA	0.250 J	NA	2.1	34.0	ND	ND	ND	4,200/21,000	61,000	NE	61,000	NE

TABLE B-4b (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-17-36 05/21/01	SB-19-03 05/21/01	SB-19-36 05/21/01	SB-20-03 05/21/01	SB-20-35.5 05/21/01	SB-21-03 05/22/01	SB-21-38 05/22/01	SB-21-38D 05/22/01	SB-22-03 05/22/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	0.47	NA	NA	ND	ND	ND	ND	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	0.51	NA	NA	ND	ND	0.140 J	ND	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	0.6	NA	NA	0.270 J	ND	0.150 J	ND	ND	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	1.1	NA	NA	0.230 J	ND	ND	ND	ND	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	0.73	NA	NA	0.250 J	ND	0.170 J	ND	ND	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	0.46	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	**0.96**	NA	NA	0.290 J	ND	0.180 J	ND	ND	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	ND	NA	NA	ND	0.68 J	ND	ND	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	ND	NA	NA	ND	ND	ND	ND	ND	ND	930/930	410,000	930	410,000	930
Carbazole	ND	NA	NA	ND	ND	ND	ND	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	0.75	NA	NA	0.320 J	ND	0.220 J	ND	ND	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	ND	NA	NA	ND	ND	ND	ND	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	1.1	NA	NA	0.40	ND	0.42	ND	ND	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	0.85	NA	NA	ND	ND	ND	ND	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	0.55	NA	NA	0.180 J	ND	ND	ND	ND	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Naphthalene	ND	NA	NA	ND	ND	ND	ND	ND	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	0.57	NA	NA	0.240 J	ND	0.51 J	ND	ND	ND	NE/NE	NE	NE	NE	NE
Phenol	ND	NA	NA	ND	ND	ND	ND	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	1.1	NA	NA	0.56	ND	0.39	ND	ND	ND	4,200/21,000	61,000	NE	61,000	NE

TABLE B-4b (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-22-36 05/22/01	SB-23-03 05/22/01	SB-23-37.5 05/22/01	SB-24-03 05/22/01	SB-24-36 05/21/01	SB-25-03 05/21/01	SB-25-36 05/21/01	SB-26-03 05/21/01	SB-26-36 05/21/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	ND	NA	NA	ND	ND	ND	ND	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	ND	NA	NA	ND	ND	ND	ND	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	ND	NA	NA	ND	ND	ND	ND	0.180 J	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	ND	NA	NA	ND	ND	ND	ND	0.150 J	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	ND	NA	NA	ND	ND	ND	ND	0.200 J	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	ND	NA	NA	ND	ND	ND	ND	0.210 J	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	ND	NA	NA	ND	ND	ND	ND	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	ND	NA	NA	ND	ND	ND	ND	ND	ND	930/930	410,000	930	410,000	930
Carbazole	ND	NA	NA	ND	ND	ND	ND	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	ND	NA	NA	ND	ND	ND	ND	0.250 J	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	ND	NA	NA	ND	ND	ND	ND	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	ND	NA	NA	ND	ND	ND	ND	0.330 J	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	ND	NA	NA	ND	ND	ND	ND	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	ND	NA	NA	ND	ND	ND	ND	ND	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	ND	NA	NA	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Naphthalene	ND	NA	NA	ND	ND	0.095 J	0.57	ND	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	ND	NA	NA	ND	ND	ND	ND	0.220 J	ND	NE/NE	NE	NE	NE	NE
Phenol	ND	NA	NA	ND	ND	ND	ND	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	ND	NA	NA	ND	ND	ND	ND	0.43	ND	4,200/21,000	61,000	NE	61,000	NE

TABLE B-4b (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected									Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
											Industrial-Commercial		Construction Worker	
	SB-27-03 05/21/01	SB-27-35.5 05/21/01	SB-28-03 05/22/01	SB-28-36 05/22/01	SB-29-03 05/23/01	SB-29-36 05/23/01	SB-29-36D 05/23/01	SB-30-03 05/23/01	SB-30-36 05/23/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	0.230 J	ND	ND	ND	ND	ND	ND	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	0.8 J	ND	ND	ND	ND	ND	ND	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	[redacted]	ND	ND	ND	0.120 J	ND	ND	0.150 J	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	1.6 J	ND	ND	ND	ND	ND	ND	ND	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	0.96 J	ND	ND	ND	0.140 J	ND	ND	ND	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	1.1 J	ND	ND	ND	ND	ND	ND	0.210 J	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	**1.7 J**	ND	ND	ND	0.130 J	ND	ND	ND	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	930/930	410,000	930	410,000	930
Carbazole	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	2.2 J	ND	ND	ND	0.160 J	ND	ND	0.47 J	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	0.150 J	ND	ND	ND	ND	ND	ND	0.098 J	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	3.8 J	ND	ND	ND	0.320 J	ND	ND	0.220 J	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	0.280 J	ND	ND	ND	ND	ND	ND	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	0.96 J	ND	ND	ND	ND	ND	ND	0.210 J	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Naphthalene	ND	ND	ND	ND	ND	ND	ND	0.150 J	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	4.4 J	ND	ND	ND	0.220 J	ND	ND	0.45	ND	NE/NE	NE	NE	NE	NE
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	4.8 J	ND	ND	ND	0.230 J	ND	ND	0.52 J	ND	4,200/21,000	61,000	NE	61,000	NE

TABLE B-4b (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - SVOC
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected				QC Sample	Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
							Industrial-Commercial		Construction Worker	
	SB-31-03 05/23/01	SB-31-38 05/23/01	SB-32-03 05/23/01	SB-32-37 05/23/01	SEQB-1 05/23/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Acenaphthene	ND	ND	ND	ND	ND	570/2,900	120,000	NE	120,000	NE
Acenaphthylene	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Anthracene	ND	ND	ND	ND	ND	12,000/59,000	610,000	NE	610,000	NE
Benzo(a)anthracene	ND	0.080 J	0.130 J	ND	ND	2/8	8	NE	170	NE
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	5/25	8	NE	170	NE
Benzo(k)fluoranthene	ND	ND	0.170 J	ND	ND	49/250	78	NE	1,700	NE
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Benzo(a)pyrene	ND	ND	ND	ND	ND	8/82	0.8	NE	17	31,000
bis(2-Ethylhexyl) phthalate	ND	ND	ND	ND	ND	3,600/31,000	410	31,000	4,100	31,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	930/930	410,000	930	410,000	930
Carbazole	ND	ND	ND	ND	ND	0.6/2.8	290	NE	6,200	NE
Chrysene	ND	0.110 J	0.160 J	ND	ND	160/800	780	NE	17,000	NE
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	2/7.6	0.8	NE	17	NE
Dibenzofuran	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
Fluoranthene	ND	0.170 J	0.200 J	ND	ND	4,300/21,000	82,000	NE	82,000	NE
Fluorene	ND	ND	ND	ND	ND	560/2,800	82,000	NE	82,000	NE
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	14/69	8	NE	170	NE
2-Methylnaphthalene	ND	ND	ND	ND	ND	NE/NE	NE	NE	NE	NE
4-Methylphenol	ND	ND	ND	1.3	ND	NE/NE	NE	NE	NE	NE
Naphthalene	ND	ND	ND	ND	ND	84/420	82,000	NE	8,200	NE
Phenanthrene	ND	0.140 J	0.170 J	0.330 J	ND	NE/NE	NE	NE	NE	NE
Phenol	ND	ND	ND	ND	ND	100/100	1,000,000	NE	120,000	NE
Pyrene	ND	ND	0.180 J	ND	ND	4,200/21,000	61,000	NE	61,000	NE

Notes:

D = Duplicate sample
J = Estimated value
NA = Not analyzed for
ND = Not detected
NE = Not established
QC = Quality control
SVOC = Semivolatile organic compound

All values are expressed in milligrams per kilogram.

TABLE B-4c
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-1-02 07/13/99	SB-1A-2 07/13/99	SB-1A-2.5 07/13/99	SB-1-57 07/13/99	SB-1A-3 07/13/99	SB-1A-3.5 07/13/99	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	2.2 J	NA	NA	0.618 J	NA	NA	5	20	820	NE	82	NE
Arsenic	**25.5**	NA	NA	**21 J**	NA	NA	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	ND	NA	NA	ND	NA	NA	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	3.86 J	NA	NA	3.03 J	NA	NA	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	9.58	NA	NA	9.71	NA	NA	NE	NE	10,000	420	4,100	8,800
Copper	24.5	NA	NA	22.5	NA	NA	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	2.66	202	[redacted]	23.1	31.1	10.1	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	ND	NA	NA	ND	NA	NA	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	23.5	NA	NA	21.5	NA	NA	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	0.276	NA	NA	0.398	NA	NA	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	NA	NA	ND	NA	NA	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	ND	NA	NA	0.276	NA	NA	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	50.1	NA	NA	51.7	NA	NA	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	10.5	NA	NA	21.1	NA	NA	NE	NE	NE	NE	NE	NE
pH	9.65	NA	NA	9.1	NA	NA	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-1A-4 07/13/99	SB-2-13 07/13/99	SB-2-57 07/13/99	SB-3-13 07/13/99	SB-3-57 07/13/99	SB-4-13 07/13/99	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	NA	ND	0.264 J	0.228 J	0.746 J	ND	5	20	820	NE	82	NE
Arsenic	NA	**3.83**	**13.8**	**8.74**	**24.1**	**8.02**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	NA	ND	ND	ND	ND	ND	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	NA	ND	2.48 J	2.23 J	4.24 J	ND	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	NA	4.55	8.09	10.3	10.1	6.48	NE	NE	10,000	420	4,100	8,800
Copper	NA	5.72	13.4	10.6	24.2	5.71	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	8.75	49.9	6.72	39.2	19	[redacted]	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	NA	ND	ND	ND	ND	ND	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	NA	6.83	15.5	12.7	22.9	3.93	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	NA	ND	0.494	0.211	0.446	0.281	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	NA	ND	ND	ND	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	NA	ND	0.204	ND	0.366	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	NA	24.4	43.2	33.3	63.5	42.5	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	NA	21.5	17.9	20.8	21.7	15.5	NE	NE	NE	NE	NE	NE
pH	NA	8.46	8.71	8.63	9.03	8.03	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-4-57 07/13/99	SB-5-13 07/13/99	SB-5-57 07/13/99	SB-6-03 05/21/01	SB-6-35 05/21/01	SB-7-03 05/22/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	0.225 J	0.517 J	ND	ND	ND	ND	5	20	820	NE	82	NE
Arsenic	**4.96**	**7.74**	**4.18**	**8.7**	**8.5**	**3.4**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	ND	ND	ND	0.87	0.32 J	**1.1**	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	ND	ND	0.23	ND	0.67	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	9.02	8.55	6.85	25.2	10.9	22.3	NE	NE	10,000	420	4,100	8,800
Copper	10.5	9.72	13.6	18	14.1	30.7	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	140	56.7	6.71	17.8 J	6	18.4	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	ND	ND	ND	0.043	0.02 J	.038 J	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	11.9	8.18	19	23	14.9	27.9	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	0.299	0.311	0.328	ND	ND	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	ND	ND	ND	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	0.25	0.343	ND	2	0.56 J	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	38.5	51.7	75.3	62.6	43.8	70.2	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	18.7	21	18.7	19.3	15.8	20.9	NE	NE	NE	NE	NE	NE
pH	7.93	6.47	7.41	7.76	7.86	7.78	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-7-39 05/22/01	SB-7-39D 05/22/01	SB-8-03 05/21/01	SB-8-37 05/21/01	SB-9-03 05/21/01	SB-9-03D 05/21/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	ND	ND	ND	ND	ND	ND	5	20	820	NE	82	NE
Arsenic	**8.3**	**10.3**	**8.7**	**9.2**	**7.8**	**10.9**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.35	0.34 J	0.33	0.3 J	0.86	0.95	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	ND	ND	ND	0.15 J	0.22	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	9.7	9.6	11	9	23.7	28.2	NE	NE	10,000	420	4,100	8,800
Copper	13.2	11.6	7.7	10.2	18	19.8	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	17.3	18.7	4.3	8.2	11.5 J	21.7 J	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.022 J	0.016 J	0.029 J	0.024 J	0.044	0.047	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	15.2	14	10.3	12.9	22.1	30.3	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	ND	ND	ND	ND	ND	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	ND	ND	ND	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	ND	ND	1.1	ND	1.9	1.5	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	35.9	34.7	26.5	34	63.5	61.9	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	12.9	13.8	10.1	12.7	17.3	19.3	NE	NE	NE	NE	NE	NE
pH	7.83	8.04	8.09	8.15	7.56	7.45	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-9-37 05/21/01	SB-11-03 05/22/01	SB-11-36 05/22/01	SB-12-03 05/21/01	SB-12-49 05/21/01	SB-14-03 05/22/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	ND	1.5 J	ND	NA	NA	ND	5	20	820	NE	82	NE
Arsenic	**7**	**4.8**	**7.6**	NA	NA	**5.3**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.36 J	0.61	0.32 J	NA	NA	0.75	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	0.10 J	ND	ND	NA	NA	0.24	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	11	22.1	10.1	NA	NA	15.6	NE	NE	10,000	420	4,100	8,800
Copper	15.9	35.9	11.8	NA	NA	27.3	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	20.3 J	291	36	13.1 J	7.8 J	[redacted]	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.027 J	[redacted]	0.015 J	NA	NA	0.054 J	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	14.5	18.3	12.9	NA	NA	17.7	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	ND	ND	ND	NA	NA	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	ND	ND	NA	NA	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	0.7 J	0.6	ND	NA	NA	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	37.5	64	34.7	NA	NA	74	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	13.8	28.7	17.1	NA	NA	21.7	NE	NE	NE	NE	NE	NE
pH	11.38	5.19	8.38	NA	NA	**8.38**	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-14-36 05/22/01	SB-15-03 05/22/01	SB-15-35 05/22/01	SB-16-03 05/22/01	SB-16-37 05/22/01	SB-17-03 05/21/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	NA	ND	2.3 J	ND	ND	ND	5	20	820	NE	82	NE
Arsenic	NA	**6.4**	**5.5**	**3.2**	**8.6**	**8.6**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	NA	0.42	0.7	0.32 J	0.35 J	0.87	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	NA	0.16 J	0.36	ND	ND	0.2	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	NA	12.4	36.7	9.3	10.8	23.4	NE	NE	10,000	420	4,100	8,800
Copper	NA	16.4	30.8	5.5	14.9	17.7	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	NA	[redacted]	[redacted]	67	16.4	35.7 J	NE	NE	400	NE	400	NE
TCLP Lead	NA	[redacted]	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	NA	0.19 J	0.090 J	0.011 J	0.02 J	0.036 J	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	NA	10.2	14.5	6.6	16.3	22.6	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	NA	ND	0.6	ND	ND	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	NA	ND	ND	ND	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	NA	1.2	2.1	ND	ND	1.5	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	NA	153	94.4	20.4	40.6	57.9	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	NA	15.4	23.5	19.2	18	17	NE	NE	NE	NE	NE	NE
pH	NA	8.72	8.28	6.64	7.56	8.83	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-17-36 05/21/01	SB-19-03 05/21/01	SB-19-36 05/21/01	SB-20-03 05/21/01	SB-20-35.5 05/21/01	SB-21-03 05/22/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	ND	NA	NA	ND	ND	ND	5	20	820	NE	82	NE
Arsenic	**6.5**	NA	NA	**7.8**	**4.9**	**5.8 J**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.24 J	NA	NA	0.52 J	**1.1**	0.33	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	NA	NA	0.54 J	0.35	0.12 J	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	9.2	NA	NA	14.8	10.2	10.5	NE	NE	10,000	420	4,100	8,800
Copper	7.9	NA	NA	32.2	17.4	12.8	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	35.5 J	15 J	60 J	[redacted]	111 J	124 J	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.028 J	NA	NA	1.5	0.042 J	0.017 J	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	9.2	NA	NA	14.9	14.7	12.8	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	ND	NA	NA	0.93	ND	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	NA	NA	0.19 J	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	ND	NA	NA	0.98	ND	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	27.5	NA	NA	98.9	68	34.1	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	15.6	NA	NA	14.5	26	14.3	NE	NE	NE	NE	NE	NE
pH	8.81	NA	NA	10.84	9.63	9.84	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-21-38 05/22/01	SB-21-38D 05/22/01	SB-22-03 05/22/01	SB-22-36 05/22/01	SB-23-03 05/22/01	SB-23-37.5 05/22/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	ND	ND	ND	ND	NA	NA	5	20	820	NE	82	NE
Arsenic	**7**	**4.8**	**4.4**	**3.8**	NA	NA	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.27 B	0.21 J	0.27 J	0.23 J	NA	NA	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	0.090 J	ND	ND	NA	NA	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	10	7.8	8.4	7.7	NA	NA	NE	NE	10,000	420	4,100	8,800
Copper	11.5	8.6	5.5	5.4	NA	NA	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	35.2	230	138	7.1		10.8	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA		NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.02 J	0.023 J	0.41 J	0.022 J	NA	NA	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	12.2	10.5	5.7	5.9	NA	NA	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	ND	ND	ND	ND	NA	NA	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	ND	ND	ND	NA	NA	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	ND	ND	ND	ND	NA	NA	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	37.1	26.6	29.3	21.1	44.9	51	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	20.8	19.7	17.9	15.9	12.1	17.3	NE	NE	NE	NE	NE	NE
pH	8.04	7.97	8	7.75	NA	NA	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-24-03 05/22/01	SB-24-36 05/21/01	SB-25-03 05/21/01	SB-25-36 05/21/01	SB-26-03 05/21/01	SB-26-36 05/21/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	ND	ND	ND	ND	ND	ND	5	20	820	NE	82	NE
Arsenic	**6**	**13.4**	**7.6**	**13.7**	**5.6**	2.3 J	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.26 J	0.36	0.87	0.62	0.59	ND	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	ND	0.2	1.4	0.48	ND	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	9.4	13.6	24.2	15.3	15.9	5.6	NE	NE	10,000	420	4,100	8,800
Copper	10.2	9.9	19	34.4	24.3	6.9	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	12.8 J	16.6 J	49 J	[redacted]	[redacted]	56.7 J	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	[redacted]	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.021 J	0.026 J	0.04 J	0.018 J	0.1	0.022 J	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	10.9	10.7	21.7	22.9	17.9	4.9 J	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	ND	ND	ND	1.5	0.54	1	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	ND	ND	ND	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	0.91	0.74 J	1.2	ND	0.54 J	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	33.3	35.6	70.5	79.9	126	20.2	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	16	17.3	18.8	28.4	18.5	16.1	NE	NE	NE	NE	NE	NE
pH	7.93	8.28	7.88	7.37	7.65	8.04	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-27-03 05/21/01	SB-27-35.5 05/21/01	SB-28-03 05/22/01	SB-28-36 05/22/01	SB-29-03 05/23/01	SB-29-36 05/23/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	ND	ND	ND	ND	ND	ND	5	20	820	NE	82	NE
Arsenic	**5.4**	**6.9**	**5.4**	**10.9**	**3.4**	**5.4**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.25 J	0.088 J	0.27 J	0.34 J	0.39	0.49	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	ND	ND	0.11 J	0.18	ND	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	8.8	8.6	8.3	10.2	49.2 J	14.6 J	NE	NE	10,000	420	4,100	8,800
Copper	8.6	7	7.7	13.8	15.5 J	14.2 J	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	78.6 J	6 J	83.3	26.4	[redacted]	202 J	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.14	0.02 J	0.024 J	0.018 J	0.28	0.045	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	7	9.9	9.5	15.9	19.2 J	11.8 J	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	0.59	ND	ND	ND	0.65	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	ND	ND	ND	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	ND	ND	ND	0.67 J	ND	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	30.1	25.4	25	32.3	73.3 J	50 J	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	22.7	15.4	12.7	13.5	11.1	20.1	NE	NE	NE	NE	NE	NE
pH	8.02	7.86	8.07	8.35	11.51	7.75	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route		Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-29-36D 05/23/01	SB-30-03 05/23/01	SB-30-36 05/23/01	SB-31-03 05/23/01	SB-31-38 05/23/01	SB-32-03 05/23/01	Class I Groundwater	Class II Groundwater	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
TPP Metals												
Antimony	ND	[redacted]	ND	ND	ND	ND	5	20	820	NE	82	NE
Arsenic	**6.6**	[redacted]	**5.8**	**4**	**7**	**8.8**	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.66	0.51	0.38 J	0.34 J	0.15 J	0.14 J	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	6.8	ND	0.5	ND	0.17 B	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	16.4 J	33.7 J	13.2 J	10 J	13 J	4.1	NE	NE	10,000	420	4,100	8,800
Copper	21.5 J	1,060 J	11 J	7.3 J	8.6 J	33.8	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	152 J	[redacted]	383 J	33 J	25.1 J	[redacted]	NE	NE	400	NE	400	NE
TCLP Lead	NA	[redacted]	NA	NA	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.056	0.11	0.021 J	0.032 J	0.016 J	0.043	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	18.2 J	41.7 J	13.8 J	5.3	3.2 J	3.6	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	ND	[redacted]	ND	ND	ND	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	2.3	ND	ND	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	0.59 J	2.6	ND	ND	ND	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	63.4 J	2,240 J	42.7 J	97.5	14.5 J	63.5	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry												
Percent Moisture	18.9	17.3	17.7	24.2	24.2	18.7	NE	NE	NE	NE	NE	NE
pH	7.34	8.15	7.66	6.88	6.45	7.21	NE	NE	NE	NE	NE	NE

TABLE B-4c (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - TPP METALS AND CLASSIC CHEMISTRY
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected: SB-32-37 05/23/01	QC Sample: SEQB-1 05/23/01	pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route: Class I Groundwater	pH-Specific Soil Remediation Objectives for Soil Component of Groundwater Ingestion Route: Class II Groundwater	Tier 1 Remediation Objectives for Industrial-Commercial Sites: Industrial-Commercial: Ingestion Exposure Route	Tier 1 Remediation Objectives for Industrial-Commercial Sites: Industrial-Commercial: Inhalation Exposure Route	Tier 1 Remediation Objectives for Industrial-Commercial Sites: Construction Worker: Ingestion Exposure Route	Tier 1 Remediation Objectives for Industrial-Commercial Sites: Construction Worker: Inhalation Exposure Route
TPP Metals								
Antimony	ND	ND	5	20	820	NE	82	NE
Arsenic	**4.6**	ND	25 to 31	100 to 120	3	1,200	61	25,000
Beryllium	0.069 J	ND	1.1 to 8,000	140 to 1,000,000	1	2,100	29	44,000
Cadmium	ND	ND	1.0 to 430	10 to 4,300	2,000	2,800	200	59,000
Chromium	7.7	ND	NE	NE	10,000	420	4,100	8,800
Copper	4.2	ND	330 to 330,000	330 to 330,000	82,000	NE	8,200	NE
Lead	21.1	0.0058	NE	NE	400	NE	400	NE
TCLP Lead	NA	NA	0.0075	0.1	NE	NE	NE	NE
Mercury	0.03 J	0.000066 J	0.01 to 8.0	0.05 to 40	610	540,000	61	52,000
Nickel	2.4 J	ND	20 to 3,800	400 to 76,000	41,000	21,000	4,100	440,000
Selenium	0.61	ND	2.4 to 24	2.4 to 24	10,000	NE	1,000	NE
Silver	ND	ND	0.24 to 110	NE	10,000	NE	1,000	NE
Thallium	ND	ND	1.6 to 3.8	16 to 38	160	NE	160	NE
Zinc	29.2 J	0.0043 J	1,000 to 53,000	2,000 to 110,000	610,000	NE	61,000	NE
Classic Chemistry								
Percent Moisture	14.9	NA	NE	NE	NE	NE	NE	NE
pH	5.63	NA	NE	NE	NE	NE	NE	NE

Notes:
J = Estimated value
NA = Not analyzed for
ND = Not detected
NE = Not established
QC = Quality control
TCLP = Toxicity Characteristic Leaching Procedure
TPP = Total Priority Pollutant

All values are expressed in milligrams per kilogram.

TABLE B-4d
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - PCBs AND HERBICIDES
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected								Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
										Industrial-Commercial		Construction Worker	
	SB-14-03 05/22/01	SB-20-03 05/21/01	SB-20-35.5 05/21/01	SB-21-03 05/22/01	SB-21-38 05/22/01	SB-21-38D 05/22/01	SB-25-03 05/21/01	SB-25-36 05/21/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
PCBs													
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1260	0.011	0.029	0.007 J	ND	ND	ND	0.014	0.0056 J	NE/NE	1	NE	1	NE
Herbicides													
2,4-D	NA	NA	NA	ND	ND	ND	NA	NA	1.5/7.7	20,000	NE	2,000	NE
2,4-DB	NA	NA	NA	ND	ND	ND	NA	NA	NE/NE	NE	NE	NE	NE
2,4,5-TP	NA	NA	NA	ND	ND	ND	NA	NA	11/55	16,000	NE	1,600	NE
2,4,5-T	NA	NA	NA	ND	ND	ND	NA	NA	NE/NE	NE	NE	NE	NE
Dalapon	NA	NA	NA	ND	ND	ND	NA	NA	0.85/8.5	61,000	NE	6,100	NE
Dicamba	NA	NA	NA	ND	ND	ND	NA	NA	NE/NE	NE	NE	NE	NE
Dichlorprop	NA	NA	NA	ND	ND	ND	NA	NA	NE/NE	NE	NE	NE	NE
Dinoseb	NA	NA	NA	ND	ND	ND	NA	NA	0.34/3.4	2,000	NE	200	NE
4-Nitrophenol	NA	NA	NA	ND	ND	ND	NA	NA	NE/NE	NE	NE	NE	NE
Pentachlorophenol	NA	NA	NA	ND	ND	ND	NA	NA	NE/NE	NE	NE	NE	NE

TABLE B-4d (Continued)
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - PCBs AND HERBICIDES
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected						QC Sample	Class I/ Class II Migration to Groundwater Value	Tier 1 Remediation Objectives for Industrial-Commercial Sites			
									Industrial-Commercial		Construction Worker	
	SB-26-03 05/21/01	SB-26-36 05/21/01	SB-27-03 05/21/01	SB-27-35.5 05/21/01	SB-32-03 05/23/01	SB-32-37 05/23/01	SEQB-1 05/23/01		Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
PCBs												
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Aroclor 1260	[redacted]	ND	ND	ND	ND	ND	ND	NE/NE	1	NE	1	NE
Herbicides												
2,4-D	NA	NA	NA	NA	NA	NA	ND	1.5/7.7	20,000	NE	2,000	NE
2,4-DB	NA	NA	NA	NA	NA	NA	ND	NE/NE	NE	NE	NE	NE
2,4,5-TP	NA	NA	NA	NA	NA	NA	ND	11/55	16,000	NE	1,600	NE
2,4,5-T	NA	NA	NA	NA	NA	NA	ND	NE/NE	NE	NE	NE	NE
Dalapon	NA	NA	NA	NA	NA	NA	ND	0.85/8.5	61,000	NE	6,100	NE
Dicamba	NA	NA	NA	NA	NA	NA	ND	NE/NE	NE	NE	NE	NE
Dichlorprop	NA	NA	NA	NA	NA	NA	ND	NE/NE	NE	NE	NE	NE
Dinoseb	NA	NA	NA	NA	NA	NA	ND	0.34/3.4	2,000	NE	200	NE
4-Nitrophenol	NA	NA	NA	NA	NA	NA	ND	NE/NE	NE	NE	NE	NE
Pentachlorophenol	NA	NA	NA	NA	NA	NA	ND	NE/NE	NE	NE	NE	NE

Notes:
J = Estimated value
NA = Not analyzed for
ND = Not detected
NE = Not established
PCB = Polychlorinated biphenyl
QC = Quality control

All values are expressed in milligrams per kilogram.

TABLE B-4e
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - GRO/DRO
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, ILLINOIS

Parameter	Sample Number and Date Collected				Soil Attenuation Capacity < 1 Meter bgs	Soil Attenuation Capacity > 1 Meter bgs
	SB-31-03 05/23/01	SB-31-38 05/23/01	SB-32-03 05/23/01	SB-32-37 05/23/01		
GRO/DRO						
GRO	0.15	0.075	**2.4 J**	5.2	NE/NE	NE/NE
DRO	ND	35	**66 J**	4000	NE/NE	NE/NE
Total Petroleum Hydrocarbons	0.15	35.075	**68.4**	**4005.2**	6000	2000

Notes:
bgs = below ground surface
DRO = Diesel range organics
GRO = Gasoline range organics
J = Estimated value
ND = Not detected
NE = Not established

All values are expressed in milligrams per kilogram.

TABLE B-5
SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, IL

Parameter	Sample Number			QC Sample	Tier 1 Groundwater Remediation Objectives	
	TMW-1	TMW-2	TMW-3	WEQB-1	Class I	Class II
Volatile Organic Compounds						
Acetone	0.004 U	ND	ND	0.003	0.7	0.7
Chloromethane	ND	ND	0.0005 J	ND	NE	NE
1,2-Dichlorobenzene	ND	ND	0.0004 J	ND	0.6	1.5
1,2,3-Trichlorobenzene	ND	ND	0.0005 J	ND	NE	NE
Ethylbenzene	ND	ND	0.0003 J	ND	0.7	1
Isopropylbenzene	ND	ND	0.001	ND	NE	NE
n-Propylbenzene	ND	ND	0.001	ND	NE	NE
sec-Butylbenzene	ND	ND	0.001	ND	NE	NE
Naphthalene	ND	ND	0.019	ND	0.025	0.039
Toluene	0.0004 J	0.0004 J	0.0004 J	ND	1	2.5
p-Isopropyltoluene	ND	ND	0.0007	ND	NE	NE
m and p-Xylenes	ND	ND	0.0006 J	ND	10	10
o-Xylenes	ND	ND	0.0003 J	ND	10	10
Semivolatile Organic Compounds						
Bis(2-ethylhexyl)phthalate	ND	ND	ND	0.009 J	0.006	0.06
Naphthalene	ND	ND	[redacted]	ND	0.025	0.039
2-Methylnaphthalene	ND	ND	0.073	ND	NE	NE
Total Priority Pollutant Metals						
Antimony	ND	ND	ND	ND	0.006	0.024
Arsenic	0.0343	0.0334	0.0172	ND	0.05	0.2
Beryllium	0.00076 J	0.0025 J	0.00048 J	ND	2.0	2.0
Cadmium	ND	0.0026	ND	ND	0.005	0.05
Chromium	0.0317	0.0816	0.0239	ND	0.1	1
Copper	0.0472	0.101	0.0286	0.0028 J	0.65	0.65
Lead	[redacted]			ND	0.0075	0.1
Mercury	0.0011	0.0002	ND	ND	0.002	0.01
Nickel	[redacted]		0.03	ND	0.05	0.05
Selenium	ND	ND	ND	ND	0.05	0.05
Silver	ND	ND	ND	ND	0.05	NE
Thallium	ND	ND	ND	ND	0.002	0.02
Zinc	0.119	0.406	0.0808	0.0082 J	5	10

Notes:

J = Estimated value
ND = Not detected
NE = Not established
U = Below detection limits

All values are expressed in milligrams per liter.
Values in bold exceed TACO Tier 1 Class I groundwater remediation objectives

TABLE B-6
SAMPLES EXCEEDING TACO TIER 1 REMEDIATION OBJECTIVES
WEST PULLMAN INDUSTRIAL REDEVELOPMENT AREA
STUDY AREA NO. 13
CHICAGO, IL

Parameter Exceeding TACO Tier 1 Remediation Objective	Total No. of Investigative Samples Collected	Investigative Samples Exceeding TACO Tier 1 Remediation Objectives	Sample Concentration Range (mg/kg or mg/L)	Number of Samples that Exceed Soil Component of Groundwater Ingestion Pathway or Groundwater Ingestion Pathway Remediation Objective		Number of Samples that Exceed Tier 1 Remediation Objectives for Industrial-Commercial Sites			
						Industrial-Commercial		Construction Worker	
				Class I	Class II	Ingestion Exposure Route	Inhalation Exposure Route	Ingestion Exposure Route	Inhalation Exposure Route
Soil Samples - Total Priority Pollutant Metals									
Antimony	51	1	ND to 45.9	1	1	0	NA	0	NA
Arsenic	51	50	2.3 to 38.9	1	0	49	0	0	0
Beryllium	51	2	ND to 1.1	0	0	2	0	0	0
Lead	63	12	2.66 to 143,000	NA	NA	12	NA	12	NA
Mercury	51	1	ND to 1.5	1	0	0	0	0	0
Selenium	51	1	ND to 4.9	1	1	0	NA	0	NA
Soil Samples - Semivolatile Organic Compound									
Benzo(a)anthracene	51	2	ND to 14	2	1	1	NA	0	NA
Benzo(b)fluoranthene	51	1	ND to 12	1	0	1	NA	0	NA
Benzo(a)pyrene	51	4	ND to 13	1	0	4	NA	0	NA
Carbazole	51	1	ND to 3	1	1	0	NA	0	NA
Dibenzo(a,h)anthracene	51	1	ND to 1.9	0	0	1	NA	0	NA
Soil Samples - Volatile Organic Compound									
1,2-Dichloropropane	54	1	ND to 0.045	1	0	0	0	0	0
Benzene	54	3	ND to 0.18	3	1	0	0	0	0
Toluene	54	1	ND to 21	1	0	0	0	0	0
Soil Samples - Polychlorinated Biphenyl									
Aroclor 1260	13	1	ND to 1.2	NA	NA	1	NA	1	NA
Soil Samples - GRO/DRO									
GRO/DRO	4	1	0.15 to 4,005.2	NA	NA	NA	NA	NA	NA
Groundwater Samples									
Naphthalene	3	1	ND to 0.026	1	0	NA	NA	NA	NA
Lead	3	3	0.0652 to 0.397	3	1	NA	NA	NA	NA
Nickel	3	2	0.03 to 0.141	2	2	NA	NA	NA	NA

Notes:

mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter
NA = Not applicable
ND = Not detected

APPENDIX C

DATA VALIDATION RESULTS

(Ten Pages)

DATA VALIDATION RESULTS

As part of comprehensive site investigation (CSI) activities at the former Dutch Boy, National Lead site (Study Area No. 13) in the West Pullman Industrial Redevelopment Area in Chicago, Illinois, Tetra Tech EM Inc. (Tetra Tech) collected soil and groundwater samples from May 21 through 24, 2001. The objectives of the CSI were to (1) define the limits of impacts on subsurface soils, (2) assess the quality of groundwater in the perched aquifer beneath the site based on groundwater remediation objectives, and (3) assess the quality of site soil in terms of industrial-commercial and construction worker scenarios and groundwater migration routes.

Soil samples were analyzed by Severn-Trent Laboratories (STL, formerly Quanterra, Incorporated) of University Park, Illinois, for Total Priority Pollutant (TPP) metals, polychlorinated biphenyls (PCB), volatile organic compounds (VOC), semivolatile organic compounds (SVOC), herbicides, pH, toxicity characteristic leaching procedure (TCLP) lead, and total petroleum hydrocarbons. Groundwater samples were analyzed by STL for TPP metals, VOCs, and SVOCs. The laboratory used the following U.S. Environmental Protection Agency (U.S. EPA) "Test Methods for Evaluating Solid Waste" (SW-846) methods for the analytical parameters indicated:

- TPP metals using SW-846 Methods 6010B/7000 series
- PCBs using SW-846 Method 8082
- VOCs using SW-846 Method 8260B
- SVOCs using SW-846 Method 8270C
- Herbicides using SW-846 Method 8151A
- pH using SW-846 Method 9045B
- TCLP lead using SW-846 Methods 1312 and 6010B

In addition, STL analyzed samples for gasoline range organics (GRO) and diesel range organics (DRO) using the California Leaking Underground Fuel Tank method.

Tetra Tech evaluated the analytical data in accordance with the U.S. EPA Contract Laboratory (CLP) national functional guidelines for inorganic and organic data review dated February 1994 and October 1999, respectively. Because STL's data packages did not include chromatograms, mass spectra,

calibration data, inductively-coupled plasma interference check sample information, and other raw data, the packages were evaluated based only on the following items:

- Holding times
- Blank results
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) results
- Laboratory control sample (LCS) results
- Field duplicate sample results

Therefore, the data evaluation was not as complete as a typical data validation.

STL follows CLP practice by grouping samples received each day into sample delivery groups (SDG) and then analyzing and reporting the results for each SDG. The soil and groundwater samples were grouped as shown below.

Sampling Date	Number of Samples	SDG No.
May 21, 2001	23 soil [a,b]	203500
May 22, 2001	18 soil [b,c]	203522
May 23, 2001	10 soil [a,b,d]	203543
May 24, 2001	6 soil [a]	203563
May 24, 2001	3 groundwater[d]	203564

Notes:

[a] Plus one soil field duplicate
[b] Plus one aqueous trip blank
[c] Plus two soil field duplicates
[d] Plus one aqueous equipment blank

Sections 1.0 through 5.0 discuss Tetra Tech's validation of each SDG's analytical results. Section 6.0 provides an overall assessment of the data quality for the SDGs. Section 7.0 presents an addendum discussing Tetra Tech's data validation for additional samples collected at the site.

1.0 SDG NO. 203500

SDG No. 203500 contained 23 soil samples, 1 soil field duplicate sample, and 1 aqueous trip blank collected on May 21, 2001. No problems were observed with field duplicate sample results.

All initial analyses were performed within the quality control (QC) limits for holding times. As noted below, re-extraction of sample SB-27-03 was performed after expiration of the holding time. Because the reanalysis results rather than the original (within holding time) results are used, the reanalysis results are flagged "J" to indicate that they are estimates.

The laboratory blanks were free of analytes. However, the trip blank contained traces of acetone, a common laboratory contaminant. Similar concentrations of acetone, adjusted for dilutions, are flagged "U" to indicate that they are probably artifacts and not true environmental contamination.

Surrogate recoveries were within QC limits with one exception. In the initial analysis of sample SB-27-03, all six surrogates exhibited recoveries of 14 percent or less, whereas the lower QC limits varied from 24 to 35 percent. When the sample was reanalyzed, the surrogate recoveries ranged from 62 to 77 percent, or about in the middle of the acceptable ranges. The analyte concentrations reported for the reanalysis were greater than those for the original analysis, confirming the low bias of the original analysis. Therefore, the reanalysis results are considered more representative and are accepted, and the original results are rejected.

Most MS/MSD results were within QC limits. The SVOC MS/MSD analyses for sample SB-17-03 exhibited low recoveries for a number of compounds, including 1,3-dichlorobenzene; hexachloroethane; hexachlorobutadiene; 2,4-dinitrophenol; 4,6-dinitro-2-methylphenol; hexachlorocyclopentadiene; benzo(b)fluoranthene; and benzo(k)fluoranthene. None of these SVOCs was found in the parent sample. Most of the SVOCs involved m are well known as irregular responders. In addition, the irregularities were small, such as 42 and 50 percent for 1,3-dichlorobenzene versus the QC limits of 52 to 93 percent. These irregularities seem to reflect the extremes of normal analytical performance rather than matrix interference. No qualifications are warranted.

The soil MS analyses for sample SB-6-03 exhibited recoveries of 37 and 36 percent for antimony and 62 and 56 percent for lead, whereas the QC limits were 75 to 125 percent. Because of these matrix effects, all positive results for antimony and lead are flagged "J" to indicate that they are estimates, biased low.

The only LCS results outside QC limits were for some VOC analytes that exhibited slightly high recoveries. For instance, one recovery result for chloroethane was 145 percent, whereas the QC limits were 60 to 136 percent. Most of the VOCs involved are well known as irregular responders. No qualifications are warranted for these minor irregularities.

2.0 SDG NO. 203522

SDG No. 203522 consisted of 18 soil samples, 2 soil field duplicates, and 1 aqueous trip blank collected on May 22, 2001. No problems were observed with holding times, blank results, or field duplicate sample results.

In the VOC analysis, slightly high recoveries (142 and 146 percent versus the QC limits of 43 to 139 percent) of the first surrogate were observed for samples SB-11-36 and SB-28-36. A similar recovery (134 percent versus 64 to 132 percent) was observed for the third surrogate for sample SB-28-36. No qualifications are warranted for these minor irregularities. The laboratory narrative also notes low area counts for one or more internal standards in samples SB-7-03, SB-11-03, SB-11-36, SB-14-03, SB-21-03, and SB-28-36 in the VOC analysis and in samples SB-14-03 and SB-15-35 in the SVOC analysis. Reanalyses produced similar results, but dilution of sample SB-15-35 (which was required to bring higher concentrations within the calibration range) produced acceptable area counts. These findings confirm matrix interference in the samples involved. All positive results quantitated using an out-of-control internal standard are flagged "J" as estimates.

MS/MSD irregularities were observed in most of the analyses, which were based on sample SB-21-03. In the metal analyses, the sample contained much more lead than the spike, so no usable results are available. The matrix duplicate analysis produced high relative percent difference (RPD) results for lead (82 percent) and arsenic (57 percent). The duplicate contained much more of these metals than the primary sample, indicating sample heterogeneity. The results for these metals in sample SB-21-03 are flagged "J" as estimates. The MS/MSD recoveries for antimony were 55 and 47 percent, respectively. All positive antimony results in the data package are flagged "J" to indicate that they are estimates.

The SVOC MS/MSD analyses exhibited low recoveries for hexachlorocyclopentadiene (25 and 24 percent versus the QC limits of 42 to 127 percent) and phenanthrene (67 and 66 percent versus the QC limits of 70 to 106 percent). Hexachlorocyclopentadiene was not found in the samples, so no results for

this compound warrant qualification. However, the phenanthrene result for sample SB-21-03 is flagged "J" to indicate that it is an estimate, biased low.

In the VOC MS/MSD analyses, several compounds exhibited slightly high recoveries for the MSD sample but not for the MS sample. In addition, several accompanying LCSs exhibited slightly high recoveries for numerous compounds. For instance, cis-1,2-dichloropropene exhibited recoveries of 121 and 132 percent for the MS/MSD samples and 129 and 126 percent for the LCSs, whereas the QC limits were 63 to 122 percent. These results seem to indicate somewhat inappropriate laboratory-generated QC limits rather than sample matrix interference. No qualifications are warranted for these irregularities.

3.0 SDG NO. 203543

SDG No. 203543 consisted of 10 soil samples, 1 soil field duplicate sample, 1 aqueous equipment blank (for soil sampling equipment), and one aqueous trip blank collected on May 23, 2001. No problems were observed with the field duplicate sample results.

All original analyses were performed within the holding time limits. Reanalysis of the equipment blank sample (SEQB-1) was performed beyond the holding time limit, but the reanalysis was required by irregularities in the surrogate recoveries for laboratory QC samples, and both analyses produced the same results. No qualifications are warranted because the original results are used.

The VOC method blank contained the common laboratory contaminant acetone. All positive sample results for acetone were similar when they were adjusted for purged sample size and moisture content, so these results are flagged "U" to indicate that they are artifacts. Positive acetone results for other SDGs may also be artifacts even though no acetone was found in the associated blank samples. No analytes were found in sample SEQB-1, the soil sampling equipment blank.

During the SVOC analyses of sample SEQB-1, two method blanks and one LCS duplicate exhibited 0 percent surrogate recovery. These results are probably due to a procedural error in the spiking. No associated qualifications of field sample results are warranted.

In the soil VOC analyses, there were high recoveries of two surrogates for sample SB-30-03 and a low recovery of one surrogate for sample SB-32-37. For both the samples and for samples SB-29-03 and SB-29-36D, the last internal standard exhibited a low area count; associated positive results are flagged

"J" to indicate that they are estimates. The laboratory narrative also notes low area counts for one or two internal standards in the SVOC analyses of samples SB-30-03, SB-32-03, and SB-32-37; again, associated positive results are flagged "J" as estimates.

The DRO MS/MSD analyses for sample SB-32-03 exhibited recoveries of 184 and 350 percent, respectively, whereas the QC limits were 59 to 127 percent. The original sample results are flagged "J" as estimates because of sample heterogeneity.

The metal MS/MSD analyses were performed for sample SB-29-03 and produced highly irregular results compared to the QC limits of 75 to 125 percent. The antimony recoveries were 51 and 62 percent, chromium recoveries were both negative (that is, both spiked samples contained less than the unspiked sample), copper recoveries were 440 and 199 percent, nickel recoveries were 140 and 54 percent, and zinc recoveries were 143 and 130 percent. The lead recoveries could not be determined because the spikes contained much less than the original sample, but the RPD was 84 percent. Because of the extreme sample heterogeneity, results for antimony, chromium, copper, nickel, and zinc are flagged "J" as estimates for all the samples.

The SVOC MS/MSD analyses were also performed for sample SB-29-03. Low recoveries of many acidic compounds were observed. Because none of these compounds was found in the parent sample, no qualifications are warranted. The recoveries for benzo(k)fluoranthene were 62 and 78 percent, whereas the QC limits were 68 to 109 percent. No qualifications are warranted for this minor irregularity.

The herbicide LCS results exhibited 0 percent recoveries for dinoseb and 4-nitrophenol. These unusual results may be due to spiking error. Because neither of the herbicides was found in accompanying sample SEQB-1, no qualifications are warranted. The VOC LCS results for SDG No. 203543 included the same scattering of slightly high results as were observed for SDG No. 203522; in fact, some of the LCSs were used for both SDGs. Again, no qualifications are warranted.

The laboratory narrative notes that the DRO in sample SB-31-38 appeared to be a fuel somewhat heavier than the No. 2 diesel used as a standard. In contrast, the mixture in samples SB-32-03 and SB-32-37 appeared to be something other than a fuel and a few large, late peaks were observed in the associated chromatograms.

4.0 SDG NO. 203563

SDG No. 203563 consisted of 6 soil samples and 1 soil field duplicate sample collected on May 24, 2001. The only analysis involving these samples was the VOC analysis of sample HB-7-2. No problems were observed with holding times, blank results, surrogate recoveries, or MS/MSD results.

The LCS results exhibited a few irregularities for the early-eluting compounds. None of these compounds was found in sample HB-7-2, so no qualifications are warranted. The only positive result for this sample was for acetone. Although this common laboratory contaminant was not found in the accompanying method blank, the acetone may actually be an artifact.

5.0 SDG NO. 203564

SDG No. 203564 consisted of 3 groundwater samples and 1 aqueous equipment blank collected on May 23, 2001. No problems were observed with blank results.

Sample WEQB-1 was re-extracted for SVOC analysis after expiration of the holding time. The re-extraction was required because of surrogate-related irregularities associated with laboratory QC samples, not field samples. The only difference in the field sample results was the detection of traces of bis(2-ethylhexyl)phthalate, a common laboratory contaminant, in the original analysis but not in the reanalysis. The original analysis results should be used, but the bis(2-ethylhexyl)phthalate result should be disregarded as a probable artifact.

In the original SVOC analysis, three of six surrogate recoveries for the method blank were less than 10 percent. During the reanalysis, the same low recoveries were observed for the same three surrogates in the method blank and the LCS duplicate, but not in the LCS sample. These findings indicate a spiking error, so no qualification of field sample results is warranted.

MS/MSD analyses were performed for sample TMW-2. In the metal analyses, low recoveries were observed for antimony (62 and 65 percent) and selenium (14 and 49 percent); the QC limits were 75 to 125 percent. Positive results for these metals are flagged "J" to indicate that they are estimates, biased low.

The SVOC MS/MSD results included low recoveries for many of the later analytes in the MS and MSD samples, such as 33 and 34 percent, respectively, for benzo(a)pyrene versus the QC limits of 68 to 103 percent. Based on the same QC limits, the LCS recovery (72 percent) was acceptable for benzo(a)pyrene, but the LCS duplicate recovery was somewhat low (64 percent) for this compound. No SVOCs were found in the parent sample, and only some early analytes were found in the other aqueous samples. This unusual pattern, especially the LCS portion, indicates some sort of spiking error rather than matrix interference. In the absence of additional evidence of matrix interference, no qualification is applied.

The VOC MS/MSD analyses included a few slightly irregular recoveries, some high and some low. The accompanying LCS and LCS duplicate samples displayed a greater incidence of the same problem. None of the compounds involved was found in any aqueous sample, so no qualifications are warranted.

6.0 OVERALL ASSESSMENT OF DATA QUALITY

The analytical data are acceptable as qualified for any purpose. There are a relatively large number of estimated results. Many of these results were less than the sample reporting limit, which corresponds to the lowest calibration standard. Such extrapolations must be considered to be estimated. During the initial analyses of some samples, a few results exceeded the upper calibration limit. STL reanalyzed these samples with suitable dilution, so the sample results are not qualified.

The nature of the samples also led to qualification of some results as estimates. Many samples had heterogenous distributions of metals, probably as a result of the contamination being in the physical form of irregularly distributed particulates. Such heterogeneity complicates determination of representative concentrations. A relatively large number of results must be averaged to make such a determination. Matrix interference with the analyses was also observed for antimony and the SVOCs. For the SVOCs, this interference is manifested as the irregular results for the surrogates and internal standards for all samples as well as the MS results. The only practical way to decrease such matrix interference is to dilute the sample extracts. However, such dilution would increase the sample detection limits proportionally and may not be useful.

In the organic analyses, a relatively large number of irregularities were observed for the method blanks and LCSs. Because such samples are prepared using pure matrices, matrix interference is rare. A more likely cause of the irregularities is error in preparation of spiking solutions or addition of portions of

those solutions to the samples. All the irregular results were produced in a brief period, so it is unlikely that future sample results will be affected by the same irregularities.

7.0 ADDENDUM

Tetra Tech collected additional soil samples from the site on July 13, 2001. This addendum documents the data validation for those samples.

A total of 15 soil samples and 1 equipment blank were collected at the site on July 13, 2001, and were sent to Grace Analytical Laboratories (Grace) in Berkeley, Illinois. Grace designated these samples as SDG No. 990714A. Five soil samples were analyzed for total lead using SW-846 Method 7421. The other samples were analyzed for VOCs, SVOCs, TPP metals, and pH using the following methods:

- VOCs using SW-846 Method 8260B
- SVOCs using SW-846 Method 8270
- TPP metals using SW-846 Methods 6010B, 7041, 7421, 7470/7471, 7740, and 7841
- pH using Standard Method 2540B

Tetra Tech evaluated the sample analytical results for SDG No. 990714A in the same manner as described above for the earlier SDGs. No problems were observed with holding times or LCS results. No field duplicates were included among the samples.

The VOC laboratory blanks and most samples contained the common laboratory contaminant methylene chloride. Because this compound was not a target analyte, no qualifications are needed. The SVOC blanks contained no analytes. The equipment blank contained a low concentration of zinc, and the laboratory preparation blank contained low concentrations of arsenic and lead. All soil sample results for these three metals were much higher than the amounts in the blanks, so no qualifications are required.

VOC surrogate recoveries were acceptable. Most SVOC surrogate recoveries were also acceptable, but two of the three acidic surrogates in the equipment blank exhibited recoveries below the laboratory's QC limits. These findings were similar to effects observed for earlier aqueous samples, laboratory blanks, and LCSs. All soil samples exhibited acceptable surrogate recoveries. For these reasons and because the acidic surrogates were not target analytes for the soil samples, no qualifications are needed.

The MS/MSD results for the VOC and SVOC analyses were within QC limits. For the metals, Grace performed MS and matrix duplicate analyses. In the MS analysis, the spike contained much less lead than the sample already contained, so no MS data are available for lead, and no qualifications are warranted. The recovery for antimony was 71 percent, and that for cadmium was 69 percent, whereas the QC limits were 75 to 125 percent. All results, including nondetect results, for these two metals are flagged "J" to indicate that they are estimates because of matrix interference. The matrix duplicate analysis for sample SB-1, 5-7 resulted in excessive RPDs for arsenic and cadmium. These RPDs appear to be due to irregular distribution of the metals in the samples rather than to interference. Therefore, the results for these metals are flagged "J" only for the sample used for the analysis.

In summary, the analyses went well and exhibited only minimal problems. The analytical results can be used as qualified for any purpose.

APPENDIX D

BOREHOLE LOGS

(24 Sheets)

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-06

SUBSURFACE PROFILE

SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.5			
		Clay Dark brown/black		SB-6-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
3			31			
		Sand Light brown		SB-6-35	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
5						Saturated at 5-6 ft.
			28.5			
6		***Silt*** Gray				
8			26.5			
		Sand Light brown	25.5			
9		***Silty clay*** Brown				
10			24.5			
		End of Borehole				
11						
12						
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-7

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.3			
		Clay Black				
1				SB-7-03		
2					TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
3						
4			30.3			
		Sand Brown				
5						
6				SB-7-39	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	Duplicate sample collected
7						
8			26.3			
		Silty sand Gray				
9						
10			24.3			Saturated at 10 ft.
		Clay Gray				
11			23.3			
		End of Borehole				
12						
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-8

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0	Ground Surface	34.7			
	Loam				
1			SB-8-03		
		32.7		TPP metals, VOCs, SVOCs, pH, and TCLP lead	
2	***Sand*** Light brown				
3					
4		30.2			
	Clay	29.7			
5	***Silty sand*** Brown		SB-8-37	TPP metals , VOCs, SVOCs, pH, and TCLP lead	
6					
		27.7			
7	***Silty sand*** Gray				Saturated at 7 ft.
8					
		25.7			
9	***Clay*** Gray				
10					
11					
		22.7			
12	End of Borehole				
13					
14					
15					

Driller: Rapid Sampling

Tetra Tech EM Inc.

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-9

SUBSURFACE PROFILE | SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.5			
		Sandy clay Brown				
1				SB-9-03	TPP metals, VOCs, SVOCs, pH, and TCLP lead	Duplicate sample collected
2						
			31.5			
3		***Gravelly sand***				
			30.5			
4		***Clay*** Dark brown				
			29.5	SB-9-37	TPP metals , VOCs, SVOCs, pH, and TCLP lead	
5		***Stone***	29			
		Brown				
6		***Silty clay*** Light brown				
7						Saturated at 7.5 ft.
			26.5			
8		***Silty clay*** Gray with gravel				
			25.5			
9		***Clay*** Gray				
10						
11						
			22.5			
12		End of Borehole				
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-11

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	35.1			
1		***Clay*** Black		SB-11-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
2						
3			32.1			
4		***Sand*** Brown	31.1	SB-11-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
5		***Silty sand*** Black	30.1			
6		***Silty sand*** Brown	28.6			Saturated at 6.5 ft.
7		***Silty sand*** Dark gray	27.6			
8		***Clay*** Dark gray	26.1			
9		***Silty clay*** Gray				
10						
11						
12			23.1			
13		End of Borehole				
14						
15						

Driller: Rapid Sampling

Tetra Tech EM Inc.

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-12

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0	Ground Surface	35			
	Clay Brownish black				
1					
			SB-12-03	Total lead and TCLP lead	
2					
3					
		31.5			
4	***Gravel***	31			
	Silty clay Gray/black	30			
5	***Clay and sand*** Brown				
6					
			SB-12-49	*Total lead and TCLP lead*	
7		28			
	Clay Brown	27			
8	***Clay*** Brown				
		26			
9	***Clay*** Brown	25.5			Saturated at 9 ft.
10	***Clay*** Gray				
11					
		23			
12	End of Borehole				
13					
14					
15					

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-14

SUBSURFACE PROFILE / SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.6			
0		***Fill*** Brick, cinder, and sand		SB-14-03	TPP Metals, VOCs, SVOCs, pH, TCLP lead, and PCBs	Recovery poor
4		***Silty, gravelly, clay***	30.6	SB-14-36	VOCs	Recovery poor, only enough for VOC sample
8		End of Borehole	26.6			

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Tetra Tech EM Inc.

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-15

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34			
		Sandy clay Black				
1			33			
		Brick	32.5	SB-15-03		
2		***Silty clay*** Black			TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
3						
4			30	SB-15-35	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
		Silty clay Gray				
5						Saturated at 5 ft.
6						
7						
8			26			
		Silty clay Gray				
9						
10			24			
		End of Borehole				
11						
12						
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-16

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	32			
		Sandy loam Black	31			
1		***Sand*** Light brown		SB-16-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
2						
3						
4						
5			27	SB-16-37		
		Silty sand Gray to brown			TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
6						
7						
8						Saturated at 8 ft.
9			23			
		Clay Gray				
10						
11			21			
		End of Borehole				
12						
13						
14						
15						

Driller: Rapid Sampling

Tetra Tech EM Inc.

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-17

SUBSURFACE PROFILE | SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.8			
1		***Silt*** Dark brown				
2			32.8	SB-17-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
3		***Silty clay***				
4			30.8			
5		***Gravelly silt***	29.8	SB-17-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	Petroleum Odor at 4 to 5 ft.
6		***Sandy silty clay*** Gray				Saturated at 6 ft.
7						
8			26.8			
9		***Silty clay*** Gray				
10			24.8			
11		***Clay*** Gray	23.8			
12		End of Borehole				
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-19

SUBSURFACE PROFILE | SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	32.9			
0		***Clay***				
1				SB-19-03		
2					TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
3			29.9			
3		***Sandy clay*** Black				
4				SB-19-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
5		***Silty clay*** Gray	27.9			Petroleum Odor at 4 to 5 ft.
6						Saturated at 6 ft.
7						
8			24.9			
8		***Clay*** Gray with gravel lenses				
9						
10						
11			21.9			
11		End of Borehole				
12						
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-20

SUBSURFACE PROFILE				SAMPLE	
Depth (feet bgs)	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0	Ground Surface	33.5			
	Gravelly sand Black		SB-20-03	TPP Metals, VOCs, SVOCs, pH, TCLP lead, and PCBs	
2		31			
3	***Sand*** Brown	30.5			
	Concrete	29.5			
4	***Gravelly sand w/ silty clay***		SB-20-35.5	TPP Metals, VOCs, SVOCs, pH, TCLP lead, and PCBs	
5		28			Petroleum Odor at 5 ft.
6	End of Borehole				Geoprobe Refusal at 5.5 ft.
7					
8					
9					
10					
11					
12					
13					
14					
15					

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-21

SUBSURFACE PROFILE | SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	33.3			
		Sand Brown				
1						
				SB-21-03	TPP Metals, VOCs, SVOCs, pH, TCLP lead, PCBs, and herbicides	
2			31.3			
		Sandy clay				
3						
			29.3			
4		***Sand*** Brown				
5						
				SB-21-38	TPP Metals, VOCs, SVOCs, pH, TCLP lead, PCBs, and herbicides	Duplicate sample collected
6						
			26.3			
7		***Silty sand***				
8						Saturated at 8 ft.
			24.3			
9		***Sandy clay*** Gray				
10						
			22.3			
11		End of Borehole				
12						
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-22

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	33.8			
		Fill Gravel	32.8			
1		***Silty sand*** Black		SB-22-03	TPP Metals, VOCs, SVOCs, Ph, and TCLP lead	
2			31.8			
		Sand Brown				
3						
4				SB-22-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
			28.8			
5		***Silty sand*** Gray				
6						
7						Saturated at 7 ft.
8						
9						
			23.8			
10		***Clay*** Gray				
			22.8			
11		End of Borehole				
12						
13						
14						
15						

Driller: Rapid Sampling

Tetra Tech EM Inc.

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-23

SUBSURFACE PROFILE | SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34			
0		***Sand*** Gravelly, brown				
1				SB-23-03	Total lead and TCLP lead	
2			32			
2		***Gravelly, clayey sand***				
3						
4			30			
4		***Sand*** Brown				
5				SB-23-37.5	Total lead and TCLP lead	
6						
7						Saturated at 7.5 ft.
8			26			
8		***Silty clay*** Gray				
9						
10			24			
10		End of Borehole				
11						
12						
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-24

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.4			
		Gravelly, sandy silt Coarse, brown	33.4			
1		***Silty sand*** Gray		SB-24-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
2						
3			30.9			
		Sand Light brown	30.4			
4			29.9	SB-24-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
		Silty sand Brown				
5						
		Silty sand Brown	28.4			
6						
		Silty sand Brown	27.4			Saturated at 6-7 ft.
7		End of Borehole				
8						
9						
10						
11						
12						
13						
14						
15						

SUBSURFACE PROFILE

SAMPLE

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-25

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0	Ground Surface	34.5			
	Clay Gray to black with gravel		SB-25-03	TPP Metals, VOCs, SVOCs, pH, TCLP lead, and PCBs	
3	***Silty sand***	31.5			
4	***Clay*** Gray	30.5 / 30	SB-25-36	TPP Metals, VOCs, SVOCs, pH, TCLP lead, and PCBs	Petroleum odor at 4.5 ft.
5	***Silty gravel*** Black	29.5			
6	***Silty sand*** Grey	28.5			Saturated at 6 ft.
7	***Silty sand*** Brown				
8	***Silty sand*** Gray	26.5			
9	***Sandy silt*** Coarse	25.5			
10	***Clay***	24.5			
11	End of Borehole	23.5			
12					
13					
14					
15					

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-26

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.1			
1		***Silty Clay*** Black with some gravel		SB-26-03	TPP Metals, VOCs, SVOCs, pH, TCLP lead, and PCBs	
2			32.1			
3		***Silty sand*** Gray	31.1			
4		***Silty sand*** Gray with some gravel	30.1	SB-26-36	TPP Metals, VOCs, SVOCs, pH, TCLP lead, and PCBs	
5		***Silt*** Light gray				
6			28.1			Saturated at 6 ft.
7		***Silty sand*** Brown				
8						
9			25.1			
10		***Clay*** Gray				
11			23.1			
		End of Borehole				
12						
13						
14						
15						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Tetra Tech EM Inc.

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-21-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-27

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	33.8			
		Fill Brick, loam, white				
1				SB-27-03		
2			31.8		TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
		Sand Orange	31.3			
3			30.8			
		Sand Fine, black				
4		***Sand*** Light brown with some black		SB-27-35.5	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
5			28.3			
		Silty sand Brown				Saturated at 6 ft.
6			27.3			
		Silty sand Orange/brown	26.8			
7						
		Silty sand Gray				
8						
			24.8			
9		***Clay*** Gray				
10						
			22.8			
11		End of Borehole				
12						
13						
14						
15						

SUBSURFACE PROFILE

SAMPLE

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-22-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-28

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0		Ground Surface	34.3			
		Sandy silt				
1			33.3			
		Sand		SB-28-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
2			32.3			
		Sandy clay				
3						
4			30.3			
		Sand Brown		SB-28-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
5						
6			28.3			Saturated at 6 ft.
		Silty sand				
7						
8			26.3			
		Silty sand				
9			25.3			
		Clay Gray				
10						
11			23.3			
		End of Borehole				
12						
13						
14						
15						

Driller: Rapid Sampling

Tetra Tech EM Inc.

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-23-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-29

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
0	Ground Surface	33.3			
	Sandy gravel Light brown				
1			SB-29-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
2					
3		29.8			
4	***Clay*** Black	29.3			
	Clay Gray	28.3	SB-29-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	Duplicate sample collected
5	***Silty sand*** Brown	27.3			
6	***Silty sand*** Gray				Saturated at 6.5 ft.
7					
8		25.3			
	Clayey gravel	24.3			
9	***Silty sand*** Gray				
10		22.8			
11	***Clay*** Stiff, gray				
12		21.3			
	End of Borehole				
13					
14					
15					

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-23-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-30

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
-4			38			Top of Concrete Pad
-3						Fill material consisting of coal, gravel, and crushed brick at -4 to 0 feet bgs
-2						
-1						
0		Ground Surface				
1		***Fill*** Crushed coal material and sand		SB-30-03	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	
2						
3						
4			30			
5		***Silty sand*** Brown		SB-30-36	TPP Metals, VOCs, SVOCs, pH, and TCLP lead	Saturated
6						
7						
8			26			
9		***Gravelly sand***				
10			24			
11		***Clay*** Gray	23			

Driller: Rapid Sampling

Tetra Tech EM Inc.

Drill Method: Direct Push

Hole Size: 2"

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-23-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-31

SUBSURFACE PROFILE				SAMPLE		
Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
-4			38			Top of Concrete Pad
-3						Fill material consisting of coal, gravel, and crushed brick at -4 to 0 feet bgs
-2						
-1						
0		Ground Surface				
1		***Fill*** Crushed coal material		SB-31-03	TPP Metals, VOCs, SVOCs, pH, DRO/GRO, and TCLP lead	
2		***Silty sand*** Black	32			
3						
4		***Silty sand***	30			Strong organic odor
5		***Silty sand*** Gray, clayey	29	SB-31-38	TPP Metals, VOCs, SVOCs, pH, DRO/GRO, and TCLP lead	
6						
7						
8						
9		***Clay*** Gray	25			
10						
11			23			

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

Sheet: 1 of 1

Project: WIRA-Study Area No. 13

Location: Chicago

Date: 05-23-01

Field Personnel: Lee Christenson and Karen Kirchner

Borehole #: SB-32

SUBSURFACE PROFILE

SAMPLE

Depth (feet bgs)	Symbol	Description	Elevation (feet ACCD)	Number	Analysis	Remarks
-4			38			Top of Concrete Pad
-3						Fill material consisting of coal, gravel, and crushed brick from -4 to 0 feet bgs.
-2						
-1						
0		Ground Surface ***Silty clay***				
1			33			Strong organic odor
		Sand Brown		SB-32-03	TPP Metals, VOCs, SVOCs, pH, PCBs, DRO/GRO, and TCLP lead	
2			32			
		Silty, sandy, clay				
3						
4						
5			29			
		Silty clay Black		SB-32-37	TPP Metals, VOCs, SVOCs, pH, PCBs, DRO/GRO, and TCLP lead	Black staining and strong organic odor
6						
7						
8			26			
		Clay Gray				
9						
10			24			
		End of Borehole				
11						

Driller: Rapid Sampling

Drill Method: Direct Push

Hole Size: 2"

Tetra Tech EM Inc.

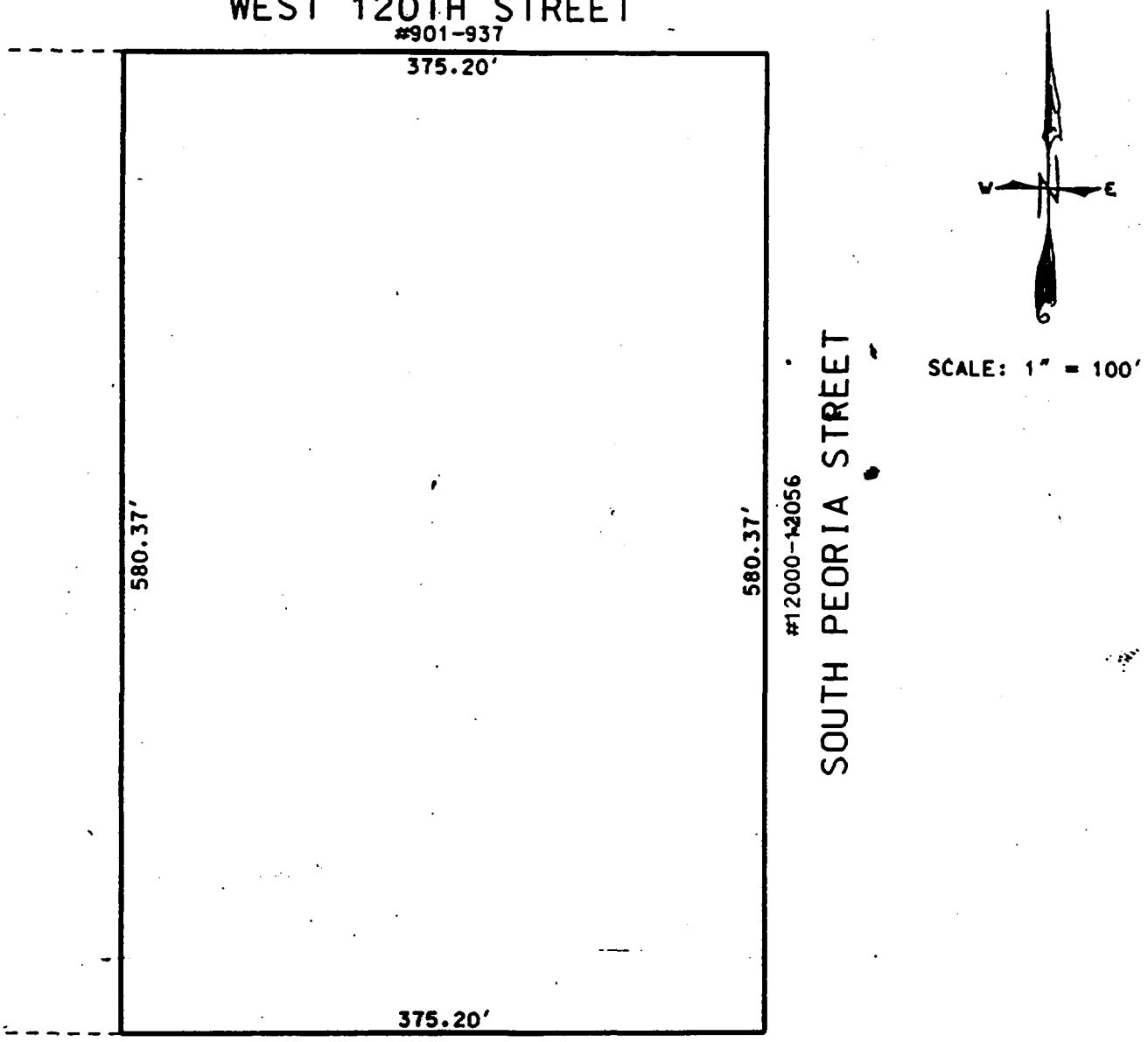
Sheet: 1 of 1

ATTACHMENT A

SITE LEGAL DESCRIPTION

(One Sheet)

PARCEL NO.	OWNER
WP 10-2	DROVERS BANK OF CHICAGO, TR # 84141



COMMENCING AT THE NORTHWEST CORNER OF PEORIA STREET AND NORTH LINE OF THE ILLINOIS CENTRAL RAILROAD (NOW KNOWN AS THE ILLINOIS CENTRAL GULF RAILROAD) RIGHT-OF-WAY AS PLATED 100 FEET WIDE; THENCE WEST ALONG THE NORTH LINE SAID RIGHT-OF-WAY 375.20 FEET; THENCE NORTH AND PARALLEL WITH PEORIA STREET 580.37 FEET MORE OF LESS. TO THE SOUTH LINE OF 120TH STREET; THENCE EAST ON THE SOUTH LINE OF 120TH STREET 375.20 FEET TO THE WEST LINE OF PEORIA STREET; THENCE SOUTH ON THE WEST LINE OF PEORIA STREET TO THE PLACE OF BEGINNING. BEING A PORTION OF BLOCK 7 IN THE FIRST ADDITION TO WEST PULLMAN. A SUBDIVISION OF THE NORTHEAST 1/4 OF SECTION 29. TOWNSHIP 37 NORTH. RANGE 14 EAST OF THE THIRD PRINCIPAL MERIDIAN. ACCORDING TO THE PLAT THEREOF RECORDED AUGUST 22. 1892 AS DOCUMENT 1721159.

02-JUL-1996

TYPE OF CONST.	NO. OF FLOORS	BASEMENT	CUBIC FEET	BLDG. AREA SQ. FT.	LAND AREA SQ. FT.
N/A	N/A	N/A	N/A	N/A	217,754.8
					ZONING M2-2

TYPE AND DATE CONVEYANCE	ASSESSED VALUE	96	TAXES	96
DEED IN TRUST	LAND	47,916	FIRST INSTALL	4,763.68
DOC. NO. 27448730	BLDG.	N/A	SECOND INSTALL	
REC. 2-20-85	VOL. NO.	471	PARCEL NO.	10 WP 10-2
	INDEX NO.	25-29-203-002		